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POISONINGS COMMON IN CHILDREN*

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MANY drugs and chemicals have caused poisoning in children but only the more common ones, as determined by a survey of all the cases of poisoning admitted to the Hospital for Sick Children, Toronto, during a ten-year period, will be discussed here.

A large proportion of these poisoning cases, both here and in the United States, occur in children under five years of age (Table I).

TABLE I.

POISONING IN CHILDREN IN THE HOSPITAL FOR SICK CHILDREN FOR A TEN-YEAR PERIOD.

	Cases	*Deaths*
Under 5 years	135	18
5 to 14 years	26	3

POISONING IN CHILDREN IN THE UNITED STATES (ILLUMINATING GAS EXCEPTED) IN A ONE-YEAR PERIOD.

	Deaths
Under 5 years	530
5 to 9 years	47

Strychnine poisoning. — Among the drug poisonings, strychnine is responsible for the largest number of cases and the highest percentage of fatalities. It usually results from the child swallowing tablets containing aloin, belladonna, strychnine and cascara (A.B.S. & C.), frequently in large numbers, sometimes as many as eighty or ninety. The widespread use of these tablets in the home and their chocolate coating are probably largely responsible for the frequency of this type of poisoning. Other tablets, such as A.B. & S., Hinkle's cascara and Blaud pill compound, also contain sufficient strychnine to cause poisoning with convulsions in a child. The number of strychnine poisonings, in this hospital and in New York State, in children under five years of age is compared with other poisonings in Table II.

TABLE II.

POISONING IN CHILDREN UNDER 5 YEARS OF AGE IN THE HOSPITAL FOR SICK CHILDREN FOR A TEN-YEAR PERIOD.

	Cases	*Deaths*
Strychnine	32	6
(A.B.S. & C. tablets)	(28)	(5)
All others	103	12
	135	18

IN NEW YORK STATE FOR SEVEN-YEAR PERIOD.

	Deaths
Strychnine	75
All others	83

It is evident that strychnine was responsible for approximately one-third to one-half of the fatal poisonings in the pre-school children represented by these two groups.

In the strychnine poisoning cases there is usually very little difficulty in diagnosis. The mother gives the history of the child having found a bottle of A.B.S. & C. tablets and swallowing a number of them. In a few hours he becomes dizzy, his face is flushed, he walks stiffly and jerkily and finally is unable to stand. If the child is induced to vomit or the stomach is washed out before the onset of convulsions the prognosis is fairly good, but otherwise the outcome is usually, although not always, fatal.

The treatment consists of gastric lavage with a weak solution of soda bicarbonate until the return is clear, and this is followed by the instillation of 2 tablespoonfuls of medicinal charcoal C.F. in a glass of water. This should be given immediately. Ether may be used to control convulsions. If muscular hypertonicity persists, sodium phenobarbital may be given in a dose of not more than 2 grains for a three-year old child, 3 grains for a five-year old child

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and 5 grains for a ten-year old child, until convulsions are controlled. Intravenous sodium amytal may be used instead of sodium phenobarbital for controlling the convulsions. The child is isolated and kept absolutely quiet.

TABLE III.

HOSPITAL FOR SICK CHILDREN, TEN-YEAR PERIOD

GROUP I—POISONINGS WITH FATALITIES

	Cases	*Deaths*
Strychnine	32	6
Illuminating gas	10	2
Morphine	4	2
Oil of wintergreen	2	2
Poison oak plant	1	1
Chloral hydrate	1	1
Lemon oil furniture polish	1	1
Zinc stearate (aspiration pneumonia)	4	2
Turpentine (aspiration pneumonia)	7	1
Sloan's Liniment (aspiration pneumonia)	1	1

GROUP II.

OTHER COMMON POISONINGS WITHOUT FATALITIES

	Cases		*Cases*
Atropine	10	Sodium hydroxide (lye)	5
Mercury	8	Acetanilid	4
Food poisonings	5	Arsenic (fly poison pads)	4
Luminal	5	Aniline dye (shoe dye)	3

Other poisonings.—Cases of poisoning with illuminating gas are less frequent now than a few years ago, probably due to better gas fittings in the poorer communities. In the treatment of illuminating gas poisoning, oxygen with 5% CO_2 to increase the depth of respiration, and external heat are used; an exsanguination transfusion and artificial respiration may be necessary. Coramine, or other stimulant, is given as required.

In morphine and opium poisoning the patient must be kept awake by constant attention, and carbon dioxide-oxygen inhalation is given. Caffeine or coramine are used to improve respiration. A purgative is also advisable.

The oil of wintergreen or methyl salicylate poisonings, both fatal, were due to drinking liniment from a bottle in the absence of the parents. Vomiting and convulsions occur up to twelve hours after ingestion. The treatment consists of gastric lavage with sodium bicarbonate solution, purgation, external heat and stimulants.

In the last three poisons listed in Group I, the fatalities were the result of aspiration pneumonia. Zinc stearate inhalation (talcum powder) is particularly likely to result in pneumonia.

Atropine poisoning in the second group, with no fatalities, is usually of a mild nature because the drug is seldom dispensed for children in solutions stronger than 1/500 grains per dram, and the child does not obtain much of the drug even though an ounce or more is swallowed. In treating these cases a gastric lavage with 1/1,000 potassium permanganate solution or sodium bicarbonate solution may be given. This is followed by the administration of medicinal charcoal C.F. Caffeine may be used occasionally.

The early symptoms of bichloride of mercury poisoning are abdominal pain, vomiting and purging with mucus and blood. There is also muscular trembling and inco-ordination with scanning and explosive speech. The late symptoms are due to kidney damage, with hæmaturia, albuminuria, and finally uræmia. As an antidote egg white in milk may be used, and vomiting is induced, if possible. Later treatment consists of treatment of the nephrosis and repair of the damaged kidney tubules.

The food poisonings were caused in two cases by canned sardines and in the others by canned fruits which had spoiled after the tin was opened. These are in reality intestinal infections with pathogenic organisms.

In poisonings with alkalies, such as lye and washing soda, a stomach tube should *not* be passed, because of the burning and necrosis of tissue. From 100 to 200 c.c. of 0.5% hydrochloric acid is given immediately, and later 8 ounces of olive oil. This may be followed by gelatin or flour in water. Stimulants are also administered.

Aniline dye poisoning occurs very infrequently in children and although the marked cyanosis is a very disturbing symptom, the poisoning is seldom of a serious nature. Recently dyed shoes, worn by the child before they are thoroughly dry, may result in poisoning by absorption through the skin. If the case is severe, 50 c.c. of 1% methylene blue may be given intravenously. In the usual case, however, external heat, caffeine and oxygen inhalation are sufficient.

The other types of poisonings in this group are treated along routine lines.

In prevention of these poisonings the chief drug to contend with is strychnine, and since A.B.S. & C. tablets are the principal source of this poison, it would seem advisable to control more adequately the sale of these tablets or eliminate strychnine from the formula. These

measures would prevent the death of a large number of children, both in Canada and the United States, each year. As for the other drug poisonings, probably very little can be done toward prevention except in the education of parents to keep these poisons out of the reach of small children. Carelessness on the part of the parents is frequently found to be the real cause of the children obtaining these poisons.

Lead poisoning.—The cases of lead poisoning are discussed as a separate group, as the clinical picture, the action of the poison in the body and the difficulties in diagnosis make these cases entirely different from the drug and food poisonings.

In a summary made four years ago, 23 cases of lead poisoning were treated at the Toronto Hospital for Sick Children during a two year period. It would thus appear that lead, rather than strychnine or illuminating gas, as was previously thought, is probably the most common single cause of poisoning in children. Of these 23 cases, 10 had cerebral symptoms on admission and 5 of these died. One case resulted in a cerebral sclerosis with mental retardation. The remaining 13 cases were of latent lead poisoning.

The symptoms of lead poisoning may for convenience be divided into early and late. It usually requires from 2 to 4 months or longer of nibbling paint before any acute symptoms arise. The duration of this early period, called by McKhann "latent lead poisoning", depends not only on the amount of lead ingested but to some extent on the amount of calcium and vitamin D in the diet. During this period the mother may notice a change in the child's disposition. The child will become cross and very irritable, and if old enough there may be complaints of abdominal pain. Anorexia soon develops and this is usually associated with constipation and occasional vomiting.

The late symptoms are characterized by the onset of convulsions. These may occur either following a slight acidosis from diarrhœa or other causes, or simply when there is sufficient concentration of lead in the brain to produce cerebral œdema. The convulsions may be more or less continuous for a period of 12 to 36 hours or may occur at intervals over a period of weeks. From this it will be seen that the symptoms of lead poisoning in children are somewhat different from those found in the adult. Abdominal cramps, wrist drop and blue lines on the gums occur very rarely in children.

Diagnosis.—In the latent cases, in addition to the finding of stippled cells, a dense white line may be seen at the epiphyseal ends of the long bones on x-ray examination, if the infant has been ingesting lead for a period of a month or more. Confirmatory evidence of this type of poisoning is the recovery of lead from the urine in a concentration greater than 5 gamma per 100 c.c.[1]

In cases which have developed convulsions as the result of lead ingestion the x-ray shows a wide, dense band or double band at the epiphyseal end of the diaphysis. In these cases the amount of lead in the urine may be as great as 30 or 40 gamma per 100 c.c.

Sources of lead in lead poisoning cases.—A child who has a natural tendency to pica may ingest sufficient lead from many different sources to cause symptoms. Metal or wooden cots which have been repainted are probably the most common source. New metal cots and cribs as purchased do not appear to be in any way dangerous because lead-free enamel is usually used in their manufacture. Play pens, however, which are made of wood, may easily have the paint scraped off by the child's teeth, and if lead is used in the paint, as is sometimes the case, they constitute a considerable source of danger. Kitchen chairs and tables, window sills and verandah railings are frequently repainted many times in the poorer districts, and the paint used in some cases contains 30% or more of lead carbonate. This thick layer of soft paint is easily nibbled off. Crayons and painted toys may add to the lead intake to a minor extent. The lead from these sources has a cumulative effect in the body due to the fact that it is normally excreted very slowly.

Age distribution.—The poisoning occurs in the large majority of cases between one and two and a half years of age, or during the "teething period". When the four central incisors have erupted the child may begin to nibble the paint from anything within reach, and this habit may persist or may terminate at any time.

TREATMENT

Cases which are recognized before the onset of convulsions are treated by the administration of fairly large doses of calcium, either in the form of lactate or phosphate, together with vitamin D to increase the absorption of the calcium.

Children of this age group are usually on a high milk diet which will also supply large amounts of both phosphorus and calcium, and in the milder cases the avoidance of an acidosis may be the only factor that is essential in treatment.

Treatment of cases which have convulsions as the result of a cerebral œdema is first directed toward decreasing the cerebral œdema by the subcutaneous injection of 10 to 20 c.c. of magnesium sulphate in 8% solution or 20 to 30 c.c. of 50% glucose intravenously. Magnesium sulphate is also given by mouth. When the convulsions have been controlled large doses of calcium are administered. Calcium gluconate is readily absorbed and repeated intravenous injections may be given. Calcium phosphate and vitamin D therapy is then begun and continued for two or three months after discharge from hospital. Iron is also given for the anæmia.

We have not attempted to delead any of the cases by the therapeutic production of an acidosis, because there is considerable danger of causing a recurrence of cerebral symptoms when more lead is allowed to circulate in the blood. The risk of this procedure is probably greater than the advantage gained. Moreover, the lead is normally excreted over a period of months. This gradual elimination is the result of normal exchange of the inorganic salt content of bone.

Previous figures on mortality are extremely high in children showing cerebral symptoms. Stewart[2] reports 1 recovery out of 7 cases. Blackfan[3] reports 1 recovery out of 4 cases; and Holt and Howard[4] report 1 recovery out of 8 cases. These cases died with so-called "lead encephalitis". The later statistics of McKhann and Vogt[5] show that one-quarter of their encephalitis cases died and one-quarter of the remainder had permanent sequelæ, such as mental retardation, muscular weakness, cerebral atrophy, blindness, etc.

The prevention of lead poisoning. — Lead poisoning is a preventable disease in children and lead-containing paints are the chief source of poison. In order to adequately prevent this condition, the elimination of these paints from the immediate environment of the child during the second and third years of life is essential. Lead-free paints are readily available, and throughout Ontario most of the manufacturers of children's cots, play pens and toys are using these paints almost exclusively. Factory legislation requires all lead-containing paints supplied to these manufacturing plants to be so labelled. Thus the lead hazard from factory-painted articles of children's furniture is probably very small. The principal hazard occurs from repainted furniture in the poorer class homes, and we would suggest that if repainting is necessary consideration should be given to the following points. Exterior house paints may contain from 20 to 60% of lead carbonate, the higher grade paints containing at least 30%. This type of paint should never be used for repainting woodwork or furniture in a home where there are small children. Interior enamels are lead-free with the exception of green, yellow and orange colours, which usually contain lead chromates as pigments; and it would be advisable, therefore, not to use these colours in repainting. The other enamels may be used on any of the child's furniture. Lacquers and varnishes are lead-free except for the addition of about 3% of lead containing dryer. A fatal case of lead poisoning in our series was found to have ingested not more than two-thirds of a gram of metallic lead.

In view of the above considerations it would seem advisable to prohibit the use of lead containing paints for toys, children's furniture, and for interior work.

SUMMARY

The cases of poisoning admitted to the Hospital for Sick Children, Toronto, over a ten-year period are presented. Many drugs and chemical irritants are responsible for the poisoning: 14% of the cases resulted fatally.

Poisonings due to lead appear to be more common and also more fatal than any other single group: preventive measures are suggested.

Strychnine poisoning is the second largest group; it usually affects children of pre-school age. In the majority of cases it is due to the ingestion of large numbers of A.B.S. & C. tablets.

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RÉSUMÉ

Parmi les empoisonnements enregistrés chez leurs petits malades de moins de cinq ans, au cours des dix dernières années, les auteurs attirent l'attention sur les plus fréquents d'entre eux, les empoisonnements par la strychnine et le plomb. Chez les enfants d'âge pré-

scolaire, les accidents du premier groupe sont consécutifs à l'ingestion de comprimés enrobés de chocolat contenant de l'aloïne, de la belladone, de la strychnine et du cascara (A.B.S. & C.). Le traitement consista en des lavages de l'estomac avec une solution faible de bicarbonate de soude, suivis de l'instillation de 2 cuillérées à table de charbon de bois médical. Pour prévenir ces accidents, on devrait contrôler plus sévèrement la vente des comprimés A.B.S. & C. ou encore en éliminer la strychnine. Quant aux autres drogues susceptibles de provoquer des intoxications, quoi de plus logique que d'éduquer les parents sur le danger de les laisser à la portée des enfants.

Dans les cas plus nombreux encore d'empoisonnements par le plomb, on s'accorde à dire que la source la plus importante de plomb provient des berceaux et lits de métal ou de bois qui, dans les foyers humbles surtout, ont été peints et repeints avec des peintures à base de plomb, il en est de même des jouets, des chaises et tables de cuisine, des rebords de fenêtres et balcons où l'enfant, qui fait ses dents, y grignote d'épaisses couches de peinture. Il importe donc avant tout d'éliminer ces peintures du voisinage immédiat de l'enfant durant les deuxième et troisième années de sa vie, ou encore de se servir de peinture ou d'émail qui ne contient pas de plomb.

THE TREATMENT OF PULMONARY TUBERCULOSIS WITH THE THIOSEMICARBAZONES

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RECENT developments in the antibiotic and chemotherapeutic management of tuberculosis have stimulated a constant search for new tuberculostatic agents which can be used either alone, or as an adjunct to other forms of therapy. The latest compounds which have been investigated in this connection are members of a group known as the thiosemicarbazones, which have been the subject of considerable study in the field of experimental tuberculosis.[1, 2, 3]

The interest of American and Canadian investigators in the thiosemicarbazones was aroused by the published experience of German authors[4] in almost 10,000 cases of pulmonary and extrapulmonary tuberculosis. These European studies indicated that the thiosemicarbazones are potent tuberculostatic agents, both *in vitro* and *in vivo*, and that they possess negligible toxic properties. The enthusiastic reports of these observers led the American Trudeau Society to appoint a team of American investigators, who, in September, 1949, visited appropriate German centres for the purpose of making an impartial assessment of the value of these preparations. Their report[5] included the recommendations, among others, that a series of thorough experimental and clinical trials be carried out in North America; and that objective and complete studies be made regarding the toxicity of the thiosemicarbazones to humans. Shortly after the publication of this report, a supply of Contibiol (4-acetylaminobenzal-thiosemicarbazone) was made available to us for therapeutic trial,* which enabled us to implement, in part at least, the recommendations of the American Trudeau Society. In view of the obvious difficulty of evaluating the effectiveness of therapeutic agents in human tuberculosis, we felt that a more definitive contribution might be made by directing our attention mainly to a careful assessment of the toxicity of this compound.

MATERIAL AND METHODS

Twenty-five patients were chosen for this study. The criteria of selection were rather elastic, but, in general, we attempted to restrict ourselves to patients with moderately advanced and far advanced tuberculosis; patients in whom surgery did not appear to be indicated in the foreseeable future; and patients who were receiving no specific therapy other than bed rest. There were 16 males and 9 females, whose ages ranged from 16 to 59 years. Fourteen were moderately advanced and 11 far advanced. There were no cases of mucous membrane tuberculosis (tracheo-bronchitis and laryngitis) available at the time of this study.

Treatment was planned to continue for three months. Each patient received a daily dose of 50 mgm. for the first week, 100 mgm. for the second week and 200 mgm. for the remainder of the course. At the beginning and end of treatment a careful clinical assessment was made of the physical status, including weight, of each patient. Throughout the course, patients were observed carefully for evidences of toxicity which had been reported in the literature, namely, skin rashes, nausea, vomiting, diarrhœa, headache, drug fever.

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* Kindly supplied by the Frank W. Horner Co.

All patients were x-rayed at the beginning of the study, at six weeks, and at the end of the course. The following laboratory investigations were carried out at intervals of two weeks, or more often if indicated in individual cases.

Hæmatologic examinations.—Hæmoglobin; red cell count; white cell count; differential count and examination of stained blood films; erythrocyte sedimentation rate; cell volume and diameter estimations (where indicated); sternal marrow biopsy (performed on all patients at the outset of the study and repeated as indicated by peripheral blood findings).

Urinary examinations.—Specific gravity; pH; protein; ketones; bilirubin; urobilinogen; microscopic examination; urea clearance tests (if routine urinalysis revealed evidence of impairment of renal function).

Estimation of liver function.—The liver function tests employed were intended primarily as screening procedures, and for this reason we chose tests which were simple to perform and of non-specific character, namely thymol turbidity, estimation of plasma proteins and the bromsulfalein test. There is evidence that liver function tests in general are somewhat unreliable in the presence of active tuberculosis,[4, 10] but we felt that they would serve adequately as rough indicators of liver damage if such occurred. It was also intended to carry out needle biopsy of the liver if evidence of severe hepatic damage was found. However no situation arose of sufficient severity to warrant the risks known to be inherent in this procedure.

Smears of sputum concentrates were examined, at the beginning of the course, at six weeks, and at the end of the study.

RESULTS

Of the 25 patients who started, only 17 were able to complete the course. In the remaining 8 cases certain complications necessitated interruption of treatment, namely; subjective toxic symptoms, 4 patients. Radiologic evidence of extension, 2 patients. Severe neutropenia, 2 patients.

In 3 of the patients suffering from subjective toxic symptoms, an attempt was made to continue therapy by reducing the daily dose to 100 mgm., but even this reduced dosage was not tolerated.

Clinical findings.—Weight.—Of the 25 patients included in the study, only 3 gained weight during the course; the remainder lost weight in amounts varying from 5 to 17 pounds.

General well-being.—All patients felt some degree of malaise during treatment and all stated categorically that they felt better when the drug was discontinued. One patient, who suffered from chronic bronchitis and bronchial asthma, stated that he felt worse in this respect after completion of treatment. Another suffered a gross extension of tuberculous disease shortly after completion of therapy, and has since died. Only one patient states that he has less sputum now than he had before treatment.

Radiological findings. — Ten cases showed radiologic improvement at the end of the study. The changes were of the same nature as those noted with streptomycin, namely some measure of resolution of the exudative component. They were, however, distinctly less in degree, being of a similar order to those noted with P.A.S. The radiologic findings in eight cases remained unchanged, while seven patients showed evidence of extension of disease.

SUBJECTIVE TOXIC EFFECTS

Nausea.—Twenty-two patients complained of nausea of significant degree during treatment.

Vomiting.—Fifteen patients suffered from vomiting of greater or lesser severity, and in some cases this symptom was so prominent that treatment had to be discontinued. Further reference will be made to this feature in subsequent paragraphs.

Diarrhœa.—This was not a common symptom, only two patients reporting its occurrence.

Headache.—Only two subjects complained of headache, which was mild and transient.

Drug fever.—Since drug fever is obviously difficult to recognize in the presence of active tuberculosis, we accepted as our standard a persistent elevation of temperature to 99.5° F. or over, in an individual who had a consistently normal temperature prior to treatment. By this standard, 12 patients were considered to have exhibited this phenomenon.

An assortment of less striking manifestations of toxicity was noted in 16 patients. These included chills, watering of the eyes, periorbital œdema, pruritus and enlargement of cervical lymph nodes.

LABORATORY FINDINGS

Sputum examination. — In 20 patients the sputum was positive for tubercle bacilli at the beginning of treatment. In 4 of these cases the

sputum became negative, but in 16, tubercle bacilli could still be demonstrated at the end of the course. Five patients began the study with negative sputum; in 2 of these the sputum became positive while they were still under treatment.

Urinalysis.—Significant proteinuria occurred in 6 patients. This was transient and presumably indicated the presence of some degree of renal irritation. There were no other urinary findings of any moment. An interesting finding, however, was the occurrence of crystalluria in 21 patients. The crystals resembled those of calcium oxalate in all respects save for the presence of rounded corners. An aqueous solution of Contibiol, allowed to crystallize, revealed acicular crystals which bore no resemblance to those described, and their origin still remains undetermined.

Liver function tests.—The sera of all patients showed normal thymol turbidity values at the beginning of the course. During treatment, repeated tests showed values of 4 units or more in 9 patients. Although significant elevations of plasma protein concentration occurred in 13 cases, in only 5 of these did the changes show any correlation with the raised thymol turbidity figures. In these 5, bromsulfalein tests gave normal results in one case, equivocal findings in another, and distinct evidence of liver damage in the remaining three. The significance of these findings will be discussed in subsequent paragraphs.

Hæmatological Findings

Erythrocyte sedimentation rate.—Repeated determinations of the erythrocyte sedimentation rate showed such fluctuant values that no conclusions could be drawn from this procedure.

Anæmia.—Anæmia of significant proportions (red cell count less than 4.0 million) occurred in 5 patients, all of whom had a normal blood picture at the outset of the study. Anæmia was first noted in the middle third of the course in all cases, and was characterized not by a precipitous fall, but rather by a slow and progressive depression of the hæmoglobin and red cell count. No concomitant increase in urinary urobilinogen was noted. Three of these cases showed mean corpuscular volumes above the normal range, while the other two had high normal values. In addition, examination by a halometric method revealed slight increase in cell diameter in three cases, and high normal values in two. Study of stained films from marrow biopsies in these patients revealed a great increase in erythroid elements in all cases, while in four, there was a relative increase in immature forms. It was the opinion of the hæmatologist who examined these films (C.R.) that, although the changes were slight, the bone marrow showed evidence of becoming megaloblastic rather than purely normoblastic. These changes speak for a macrocytic anæmia with a maturation defect.

Agranulocytosis. Two patients developed almost complete neutropenia.—In one patient the syndrome developed insidiously, with no premonitory symptoms, and was first noted in the sixth week of treatment in the course of the routine hæmatological examination. At this time, his white cell figures, which had been 11,000 total and 6,300 neutrophils at the outset, had fallen to 5,000 and 1,700 respectively. Drug therapy was immediately discontinued, but, for the next six days, the count continued to fall until the levels finally reached were 2,000 and 440. Following this, there was a gradual rise to normal. Stained marrow films examined when the peripheral blood figures were lowest, revealed a normal distribution of myeloid elements but a marked diminution in their numbers.

In the second patient, the course was quite different. After 28 days of therapy there suddenly occurred fever, sore throat, and cervical adenopathy. A white cell count at this point revealed a total of 4,000 with 900 neutrophils, the original figures having been 9,000 and 7,000 respectively. Although the total white cell count remained stationary, the neutrophils continued to fall during the next week to 120 per c.mm., most of which showed profound "toxic granulation". The total figure was maintained by an increase in lymphocytes and monocytes. This patient also gradually recovered after cessation of drug therapy. In contrast to the previous case the bone marrow revealed a very striking picture, the film being crowded with myelocytes showing great variation in size and shape, and exhibiting the same granulation as that noted in the peripheral blood. There was no eosinophilia in either case.

Discussion

It is abundantly clear that the most dramatic features of this investigation were the striking toxic effects, demonstrated both clinically and in the laboratory.

On the clinical side, it is obvious that the thiosemicarbazones are potent gastro-intestinal irritants, as evidenced by the almost universal exhibition of anorexia, nausea and vomiting. It is highly undesirable that the application of any chemotherapeutic agent in the prolonged treatment of a chronic disease such as pulmonary tuberculosis, should result in persistent loss of weight and general depression of clinical status: yet this finding was noted in all our cases. It may even be conjectured that the extension of tuberculous disease which occurred in seven patients was brought about by this impairment of general bodily resistance. This feature has not been generally noted with P.A.S. in adequate therapeutic dosage. Radiological improvement, where it occurred, was not marked, and it is entirely possible that changes of similar degree could have been produced by bed rest alone. From a clinical point of view, therefore, there appears to be little cause for enthusiasm.

The laboratory findings also indicated marked toxic potentialities, most prominent of which were the effects on the bone marrow. Mertens and Bunge[4] stated that the "toxic effects of thiosemicarbazones upon the leucocyte picture, considered as a whole, are relatively few". This was not our experience, since severe neutropenia was noted in 2 of 25 cases. Such an action might have been expected from the chemical structure of these compounds. It is many years since amidopyrine was demonstrated to be a potent cause of agranulocytosis, and Kracke in 1935[6] incriminated the benzamine linkage <⬚> - N < as the causative agent. This benzamine group is present in the thiosemicarbazones as well as in amidopyrine, and also in certain antihistamines which have recently been shown[7] to possess leucotoxic properties.

It was not only the myeloid elements of the bone marrow that were affected; the erythropoietic tissues suffered as well, a feature which has been noted by previous observers.[8, 9] However, their cases were characterized by acute hæmolytic crises with normochromic anæmia, hyperbilirubinæmia and increased urinary urobilinogen. In our series, as described above, the anæmias were insidious and progressive, and were characterized by peripheral blood and marrow findings suggestive of a maturation defect. The occurrence of significant anæmia during so short a course of treatment leads one to conjecture as to the unfortunate results which might accrue from more prolonged therapy.

The indications of impaired liver function were more difficult to interpret. In the first place, evidence has been presented[10] to indicate that, in the presence of tuberculosis, abnormally high thymol turbidity values may be obtained. Similarly, it has been found[4] that positive bromsulfalein tests may be obtained in 40% of patients with tuberculosis, even in the absence of chemotherapy. Nevertheless, these same publications have described toxic liver changes during the exhibition of the thiosemicarbazones and it is probably safe to say that the changes that we noted were indicative of liver damage. In a disease which may, in itself, be associated with a degree of impairment of hepatic function, the administration of a potential liver poison may have unpleasant consequences.

One additional feature of the laboratory findings deserves comment. It will be recalled that gross fluctuations were noted in the erythrocyte sedimentation rate throughout the course of treatment. Since this test is widely used as an index of therapeutic effect, it would appear that the exhibition of the thiosemicarbazones deprives the clinician of a valuable prognostic guide.

It is obvious from these findings, that the disadvantages of this form of therapy far outweigh its possible benefits. In view of its manifest toxicity, it requires an uneconomical degree of laboratory control. It might conceivably be of value in patients resistant to both streptomycin and P.A.S., a situation which should be encountered only rarely, with carefully planned therapy. It is our impression that its toxic potentialities preclude its usage, even as an adjunct to streptomycin therapy. It may be that some less toxic modification may be made available in the future. Until that time, however, it is our opinion that the thiosemicarbazones are not serious contenders for the position deservedly occupied by streptomycin and P.A.S. in the treatment of tuberculosis.

SUMMARY AND CONCLUSIONS

1. Twenty-five patients with pulmonary tuberculosis were treated for three months with 4-acetylaminobenzal-thiosemicarbazone, in the

most recently recommended dosage, namely 200 mgm. daily.

2. The therapeutic results were equivocal.

3. Major toxic effects were noted, including two cases of severe neutropenia.

4. It is concluded that this preparation is too toxic for general use; that it has no advantage over other therapeutic agents such as streptomycin and P.A.S.; and that, if used at all, it requires more stringent laboratory supervision than is usually available.

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RÉSUMÉ

Sur la foi de rapports étrangers accordant de hautes vertus tuberculostatiques à des substances connues sous le nom de thiosemicarbazones, les auteurs en firent l'expérience sur cingt-cinq malades, dont 14 étaient des cas modérément avancés et 11 très avancés. La dose quotidienne fut de 200 mgm.

Plus encore que l'action thérapeutique, les effets toxiques de ces drogues retinrent l'attention des rapporteurs, car ils s'avérèrent considérables, tant du point de vue clinique que des constatations de laboratoire. Parce que dans la plupart de cas les thiosemicarbazones provoquent de l'anorexie, des nausées et des vomissements, ils doivent être considérés comme de puissants irritants gastro-intestinaux. Il apparaît peu désirable alors d'user d'une thérapie qui résulte toujours en un amaigrissement persistant et une dépression généralisée, chez des tuberculeux surtout dont sept d'entre eux ont vu leurs lésions pulmonaires s'étendre par suite d'un amoindrissement de leur résistance. A noter aussi que l'amélioration des lésions du point de vue radiologique ne s'est jamais avérée marquée, et le seul repos au lit eut pu le produire. Le laboratoire démontra des effets toxiques parfois considérables, notamment sur la mœlle osseuse, sans compter deux cas très graves d'agranulocytose.

Les auteurs en concluent que cette forme de traitement présente des inconvénients que l'on ne rencontre pas avec la streptomycine et P.A.S. et qu'ils dépassent de beaucoup les avantages qu'on peut en retirer. Ils ont l'impression que sa toxicité en interdit l'emploi, même comme traitement adjoint à la streptomycinothérapie.

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THE PATHOGENESIS OF ECZEMA*

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DURING the past two decades, important strides have been made in the scientific aspects of dermatology, and a considerable body of basic facts relating to the specialty has been accumulated. Moreover, fundamental data on the physiology and chemistry of cutaneous functions are rapidly being amassed, and as such constitute the basic building blocks upon which a more complete understanding of the eczematous diseases can be derived. Be that as it may, a careful search through the recent dermatologic literature has brought to light a disturbing paucity of fundamental knowledge concerning the pathogenesis of the eczematous dermatoses.

The lack of progress in the understanding of this important group of diseases may be ascribed to a considerable degree to a faulty approach to the problem. The dermatology of 50 years ago was largely descriptive in nature. More recently, a concerted attempt has been made to pigeonhole the various eczematous dermatoses into clinical syndromes. Such classification and pigeonholing frequently obscures rather than clarifies the basic etiologic factors producing these diseases. It is only in the past 2 decades that scientific analytical studies have been instituted. Because of the obvious complexities of the eczema problem, the basic prerequisite in the approach to its study is a meticulous attention to detail. This concerns itself primarily with an analysis of the factors predisposing to disease, a careful search for exciting agents, and additional studies to determine the factors responsible for maintenance and relapse.

BASIC MECHANISMS

The skin, as do other body structures, varies tremendously in its susceptibility to disease. In the first place, a definite hereditary predisposition may be noted, especially with regard to a family or past history of pyogenic infections and of allergies such as hay fever or asthma. Susceptibility depends to a considerable extent also on the type of functional state of the skin. Specifically, the skin of the obese, particularly in the folds, is subject to maceration; when the

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patient also has an oily skin, the resulting dermatitis is often classified as seborrhœic in nature. The oily type of skin, especially when inflamed, is increasingly susceptible to contact irritations and sensitivities; conversely the ichthyotic skin is poorly equipped to cope with the effects of dry, cool weather and with various forms of chemical and mechanical irritation. Finally, hyperhidrosis enhances the ease of cutaneous sensitizations, development of vesiculation and secondary mycotic or pyogenic involvement, in part because of its macerating effect and in its raising of skin pH.

Dermatitic reactions in the skin are potentiated to a considerable degree by its previous experiences. Skin which has been the site of a previous dermatitis is in some obscure fashion conditioned to further reactivity and subsequent reactions frequently are without obvious cause. It is probable also that antecedent sensitization dermatoses potentiate the development of new and frequently unrelated sensitizations. The influence of psychosomatic predispositions on the development of dermatitis is at the moment incalculable, but is seen too frequently to be denied.

Among the external predisposing factors, heat, cold, humidity and sunlight play important rôles. To take a single example, metabolic activity is reduced when the skin is cold. This results in a decrease of oxygen tension and the amount of oxygen available in the tissues; circulation is reduced. As might be expected in this situation, cutaneous resistance to noxious agents of various types is appreciably impaired.

Internal factors which predispose to the development and maintenance of the eczematous response are but poorly understood, but preliminary data are available and of considerable interest. In a consideration of diet, a high carbohydrate diet tends to hydrate the tissues, and in some instances may raise the levels of skin sugar. A diet high in sodium chloride increases skin water and has a tendency to aggravate various types of dermatitis. On the contrary, a high protein diet tends to dehydrate the skin, while a low protein diet increases the susceptibility of the skin to infection and creates a tendency to the development of ulcers and œdema. There is some evidence too, that a diet low in unsaturated fatty acids favours the development of dermatitis, particularly infantile eczema. It would seem that the resistance of the skin to noxious agents may be diminished by increased demands of the body for excretion, storage, temperature regulation, and protection. The skin is a vast reservoir for the storage of excess body water, and the percentage of skin water is characteristically increased in pregnancy, during menses, in hypertension, renal deficiency and acidosis. In renal insufficiency and in cachexia, the non-protein nitrogens of the skin are greatly increased, which fact is of considerable importance, since the skin stores such protein residues as uric acid and creatinine, and synthesizes urea *in situ*. Such increases favour the development of pruritus, with its well-known effect on dermatitis. Impairment of the blood or nerve supply is of considerable significance. In arteriosclerosis, for example, narrowing of the cutaneous arterioles may effect seriously the nutrition of the skin; impaired venous return has a similar connotation, and increases the percentage of skin water as well. Very little is known regarding the effect of borderline endocrine abnormalities and subclinical vitamin deficiencies on the function of the skin. Available material on vitamin deficiencies is particularly confusing, although Gross[1] and others have pointed out that vitamin B complex and crude liver extract are of value in the management of seborrhœic dermatitis, and vitamin A in the therapy of nummular eczema.[2]

CLASSIFICATION OF ECZEMA

A. Primary: (1) Contact—physical agents. (2) Seborrhœic. (3) Atopic. (4) Nummular.

B. Secondary: (1) Stasis. (2) Ichthyotic. (3) Infectious. (4) Autoeczematous.

C. Psychosomatic.

D. Unclassified: (1) Resistant eczemas of hands. (2) Eczema in aged. (3) Intertriginous.

The external agents producing injury are but few in number and consist of (1) physical, chemical and mechanical agents, (2) bacteria and fungi and (3) agents other than infections inducing a hyperallergic response. Psychosomatic factors will be considered in greater detail below, but may act as predisposing, causative, additive or consequential factors in eczematous dermatoses. Autoeczematization and its variants are assuming increasing importance in the etiology of the eczema complex.

The nature of this phenomenon will be discussed further in its relation to the various forms of dermatitis, to be presently considered.

THE ECZEMATOUS REACTION OF THE SKIN TO INJURY

The eczematous reaction of the skin to injury is comparatively uniform, considering the diversity of the various etiologic agents and the fact that such agents may operate locally on the epidermis, by diffusion following follicular penetration, or by endogenous transport through the blood or lymphatic vessels. Several mechanisms of injury may be postulated, and of these direct physical or chemical insult is of major importance. Secondarily, histamine-like substances are released, with dilatation of minute vessels, engorgement of leucocytes and eosinophils, perivascular migration and increased blood flow. Presumably, the response to histamine is of fundamental significance, since histologic examination following chemical injury or the development of a sensitization dermatosis reveals a uniform basic pathologic pattern, as demonstrated by Miescher.[3] Depending upon the degree of tissue injury and upon subsequent tissue needs, a sympathetic mechanism is activated, with a variable release of acetylcholine-like and adrenergic substances. The acetylcholine-like component of this reaction results in vascular dilatation, increase in sweating and aggravation of the triple response; conversely, the release of adrenergic substances results in vascular constriction, local venostasis, impaired local nutrition and subsequent interference with the normal inflammatory response. Needless to say, pruritus is a frequent complication of such injury and leads to excoriations which, in turn, further injure the damaged tissues.

Pathological studies clarify only to a limited extent the pathogenesis of the various morphologic reaction types seen in the eczematous diseases. Polok and Mon[4] have established that the initial lesion in experimentally-produced contact dermatitis is a lysis of Malpighian cells deep in the epidermis. However, Rokstad[5] has shown that the dermatitis occurring in the epidermal sensitization reactions may be inhibited by tissue compression, which would suggest that the release of histamine in the cutis and the subsequent accumulation of tissue fluid are integral parts of the reaction. Vesiculation, ordinarily without spongiosis, may then supervene and coincidentally a capillary dilatation and a sparse but rather diffuse type of dermal infiltration can be observed. To my knowledge, the initial pathological lesions of the atopic type of dermatitis have not been recorded. Œdema and swelling of capillary endothelium are considered by Ormsby and Montgomery[6] to be of primary importance. This is accompanied by a focal perivascular infiltrate of small round cells, histiocytes, some eosinophils and a moderate interstitial œdema. This reaction, in some unexplained fashion, potentiates the development of pruritus, which in turn is followed by a variable degree of acanthosis. In the nummular type of eczema, the pathologic features of contact and atopic dermatitis are curiously admixed, but there is no unanimity of opinion concerning the earliest pathologic change. Presently available evidence indicates that in this syndrome the initial point of insult may be both the epidermis and the arterioles. Further clarification of this important point is urgently needed.

The pathological features of seborrhœic dermatitis are not too distinctive. Sachs[7] believes that the initial changes occur in the capillaries around the sebaceous glands; subsequently, a more diffuse type of dermal infiltrate supervenes, with in addition a variable amount of spongiosis. Epidermal changes are considered usually to be secondary in nature, but this concept is not entirely in accord with those investigators who emphasized the importance of increased surface sebum and secondary invasion with pityrosporum ovale or with other bacteria. A study of the exudative and lichenoid dermatosis, popularized by Sulzberger and Garbe,[8] adds further confusion to the knowledge of eczematous processes as interpreted by their pathological reactions. In this syndrome, the dermal reaction is more pronounced than in atopic dermatitis, and numerous plasma cells and eosinophils are seen. The cause of the concomitant epidermal vesiculation and œdema is likewise obscure; only the later developing acanthosis may be in part explained by the severe degree of pruritus and resultant excoriations. It is indeed a paradox that the increased evidences of allergic response as noted in the dermal infiltrate should occur in a syndrome which clinically is less closely related

to an allergic diathesis than is atopic dermatitis.

Regardless of the type of the initial inflammatory process, the immediate consequences of inflammation have many features in common. The initial increase in blood supply and tissue invasion by leucocytes and wandering cells is followed by an increased hydration of tissues, with or without clinical evidence of localized œdema. When the inflammation becomes severe, the partial dissolution of epithelial continuity results frequently in an intimate relation between the leucocytes and epidermal structures. Esplin and I[9] believe that this situation, if continued, results frequently in the development of autoeczematization; leucocytes may become tagged with epidermal antigen, and their subsequent absorption results in the development of secondary distal eczematization. It is well known (and would be expected from a study of the pathological changes) that the autoeczematous reaction is a frequent complication of various etiologically distinct forms of eczematous processes.

As might be expected, local electrolyte balance is disturbed in the eczematous response; this results in salt retention, increase in œdema and aggravation of pruritus. The supervention of exudation adds a further complicating feature to the inflammation, namely, an increase in skin pH, which in turn favours the development of secondary bacterial invasion. The influence of these pathogenic bacteria on the course of the inflammation will be considered in greater detail in the following section.

There is a further important aspect of cutaneous inflammation which to date has received but little consideration and which may have important effects on the subsequent course of the inflammation. Reference is made to the interference with normal cutaneous metabolism by the inflammatory process. The important work of Shelley and Horvath[10] indicates that various types of cutaneous injury, including maceration, erythema from ultra violet light, and inflammation caused by such substances as solid carbon dioxide and phenol, may result in sweat retention. This effect surely must occur in an accentuated form in the eczematous reaction and may cause further damage not only by the production of sweat retention vesicles but also by the backing up of the excretory products. Furthermore, the formation of urea in the sweat glands by the action of arginase on arginine, as demonstrated by Rothman and his associates,[11] may be inhibited. Likewise, sebaceous secretion may be interfered with, but the effects of such interference are as yet unknown, although it may be assumed that the ability of the skin to combat infections has become diminished. The patient with an extensive dermatitis, as a result of damage to the blood vesesls, is able to cope but poorly with variations in environmental temperature. The effect of such variations, therefore, on the course of the inflammation becomes exaggerated. Increased external heat, for example, increases further the permeability of the damaged capillaries which, in turn, accelerates transudation and tissue injury. The increase in skin temperature increases the oxygen tension of the tissues and favours the growth of aerobic organisms. The inflammatory process is affected likewise by a high environmental humidity, which interferes still further with sweat gland excretion; in consequence, sweat accumulates on or in the damaged skin, temperature and pH rise, and the resistance to infection is lowered. As yet, little is known about the intrinsic metabolism of the skin. However, Pillsbury[12] and others have demonstrated that the skin has an intrinsic carbohydrate metabolism. In inflammation, the percentage of skin sugar rises, and this is no doubt due to the fact that the skin has lost its ability to break down glycogen. The influence of the high skin sugar in the aggravation of local tissue œdema may be an important factor in the self-perpetuation of many chronic dermatitides.

ACTION AND INTERACTION OF SOME ECZEMA-PRODUCING AGENTS

The combined efforts of many investigators are gradually clarifying the pathogenesis of contact sensitization dermatitis, and it is now recognized that the reaction is one between an allergen, which penetrates into the epidermis, and a fixed type of antibody located in epidermal cells. The experiments of Haxthausen,[13] Rostenberg,[14] Schnitzer[15] and others have shown that allergen, either as such or in a conjugated form, is absorbed into the general lymphatic and/or vascular circulation. Presumably, as indicated by Sabin,[16] antibodies are formed in various reticulo-endothelial cells. If one assumes with Rostenberg that the antigen incorporates some constituent of body pro-

tein into its being, the subsequent antibody has an affinity for the parent protein and becomes attached to tissue (epidermis) containing this protein. However, it seems likely that the test antigen, and not its conjugate, must unite with the tissue in a manner analogous to that of the original sensitizer if a sensitization reaction is to ensue. Sensitization is facilitated when the allergen is a soluble substance, particularly in surface fats, or when it has an affinity for the horny layer, as is the case with dyes and local anæsthetics. Needless to say, the development of sensitization is enhanced when the substance is a primary irritant, for in this circumstance the antigen may penetrate more freely into the damaged epidermis. The evidence for the formation of antibody locally in the skin is tenuous indeed; ordinarily, antibody is not formed in the skin, as experimentally induced sensitization develop after a 6 to 10 day interval even when the primary site of antigen application is extirpated within 12 hours following the application of antigen.

In some instances, the allergen may reach both the epidermis and the dermis. In this situation, as brought out by Templeton[17] in reference to sensitizations by sulfonamides, foods and certain plants, both epidermis and dermal arterioles may become sensitized. For example, in sensitization to poison ivy, the clinical reaction may consist of both a vesicular dermatitis and an erythema multiforme-like eruption. Similarly, foods such as carrots may produce a combined type of dermatitis both by contact and by ingestion. In this connection, the work of Flood and Perry[18] and their associates has suggested that dermatitis which may be clinically indistinguishable from that produced by contacts may be due to food sensitizations via the hæmatogenous route. Contact dermatitis, frequently mild at its onset, may become disseminated through the intervention of over-treatment, infectious and autoeczematous complications. Over-treatment syndromes may be initiated through a chemical irritation and autoeczematous mechanism, or by the supervention of secondary sensitizations. In the latter situation there is evidence that the secondary sensitization may be potentiated by antecedent sensitizations, regardless of whether they are immunologically similar or distinct. Certain of these cross-sensitizations resulting from the action of immunologically similar allergens have been discussed recently by Baer.[19]

The sensitization process may be further potentiated in varying degrees, not only in contact dermatitis but also in other eczematous processes, by local bacterial invasion and (presumably) by focal infection. It is well-known that the normal skin harbours but few pathogenic bacteria. Following the development of inflammation, however, a resident colony of pathogenic bacteria, especially staphylococci and streptococci, can be identified. It is possible, as Török[20] has pointed out, that this secondary pyococcic invasion of a dermatitis not only may cause purulent exudation and secondary infectious eczematoid dermatitis, but also may result in an increase in the degree of inflammation, vesiculation and exudation. This effect may be due in part to the liberation of hyaluronidase by the invading organism. Staphylococcic invasion in particular may potentiate the development of cutaneous autosensitization, as pointed out by Hopkins and Burky.[21] The influence of a local bacterial flora (pityrosporum ovale) in the development of seborrhœic eczema has been suggested by Templeton,[22] MacKee and Lewis[23] and Kile and Engman.[24] In this connection, the potentiating effect of the seborrhœic diathesis in the development of complicating sensitizations and infections should be mentioned. Nummular eczema, long an etiological enigma, is characterized frequently by a heavy local flora of pathogenic staphylococci and/or streptococci. In addition, a chronic focus of infection frequently may be identified. In this syndrome, a local anti-infectious regimen, the use of a proper antibiotic systemically, and the removal, when feasible, of an obvious focus of infection, results not infrequently in decided improvement or cure.

A positive relationship between active focal infections and the eczematous dermatoses, particularly eczematous lesions of the dry plaque type and with more diffuse types of exfoliative dermatitis, has never been conclusively demonstrated. Brocq recognized such an eczematous diathesis and termed it an eczematid. While there may be some question as to the validity of this nomenclature, examples of the syndrome occasionally may be identified. In a recently seen patient, who later died of a severe infection involving several viscera in a subacute fashion, a patchy, ex-

foliative dermatitis had been a troublesome feature. Furthermore, a meticulous search, both clinically and by autopsy study, did not reveal another cause for the dermatitis.

In a further consideration of the effect of infectious processes on the development and maintenance of various types of eczematous dermatoses, the conception of infection allergy should be integrated. No one will deny that a severe local infection in the skin, either primary or secondary to an antecedent dermatitis, may lead to distal eczematization. In the first place, the infection may set the stage for the development of autoeczematization, possibly through the formation of a haptene antigen (products of skin plus those of bacteria). Such a mechanism has been demonstrated by Burky[25] in the sensitization of rabbits to autogenous lens substances by repeated injection of this tissue mixed with staphylococcus toxin. In addition, rapid destruction of bacteria, as for example by a sulfonamide, may liberate bacterial proteins to which the patient has become sensitized and result in severe eczematous dissemination. Conversely, a local infection may potentiate a secondary sulfonamide sensitivity. It is possible too, that one or another of the newer antibiotics may liberate bacterial products, as well as disturb the symbiotic balance between opposing groups of organisms. There may be, of course, some fundamental but as yet unknown difference in the mechanism involved when an infection is located not on the involved skin but at a distant internal focus. Preliminary observation, however, indicates that the chief difference is that of accessibility to the dermatitic area. Finally, one must consider the mechanisms involved in infection desensitization. As is well known, the effect of autogenous or stock vaccines is frequently disappointing. The work of Hopkins and Burky with staphylococcus toxin, while suggestive, has not been generally verified. Recently, the adrenocorticotropic hormone of the pituitary (ACTH) has been shown to have a dramatic effect in reversing the course of various infectious processes. This effect, while frequently temporary in nature, raises anew the entire question of infection desensitization. In its specific relation to infection allergy as it involves the skin, ACTH has been shown to reverse such antigen-antibody reactions as the tuberculin test; in a recently observed patient with active tuberculosis, the previously positive tuberculin test became negative shortly after the onset of ACTH therapy. This effect, while temporary in nature, is little short of miraculous, and when properly interpreted may lead to an entirely new approach in the management of fixed cellular sensitizations as they involve the skin.

The pathogenesis of the dermatological affliction designated currently as atopic dermatitis is far more obscure than that of the epidermal (contact) type of sensitization. This disease is characterized immunologically by immediate vascular responses to scratch and/or to intradermal inoculation with various allergenic substances, positive passive transfer tests and (frequently) by a history of hay fever, asthma, atopic eczema or urticaria in the family background. Furthermore, the eczematous reaction may be antedated in the patient by hay fever, asthma, or more ill-defined allergic syndromes. There are, however, 3 great paradoxes in this disease. First, the fact that clinical improvement rarely can be produced by specific desensitization, second, that removal from the environment of substances eliciting positive intradermal tests is only occasionally of therapeutic benefit and, third, the lack of evident clinical relationship between the urticarial type of response to skin testing and the eczematous pathologic reaction. However, it is now believed that the earliest pathologic change is in the capillary bed, which is designated as the shock tissue. If this is the case, it would seem that the agents responsible for the initiation of this syndrome reach the skin through the blood stream, and that aggravating factors operate primarily on the blood vessels.

Etiologically, inhaled or ingested allergens are frequently incriminated. An interesting feature of the disease in infants is that clinical manifestations are preceded frequently by positive cutaneous tests to such substances as egg white, fish and nuts, prior to their ingestion by the infant. Presumably, this sensitization phenomenon is transferred from the allergic mother; the question to be asked, however, is whether or not such sensitization may predispose in some way to the development of other sensitizations and to the subsequent development of eczema. As Keston[26] has emphasized, atopic dermatitis in infants is often a reaction to ingested allergens with aggravation following ingestion of a specific food or foods and (frequently) improvement after their re-

moval from the diet. Why then should later developing sensitizations have less and less clinical significance? The experiments of Becker and Van de Erve[27] have indicated that the atopic skin is an "irritable" one and observers agree that this irritability may persist well into adult life.

It would seem that various agents other than so-called specific allergens may influence markedly the subsequent course of the disease. For example, Norrlind[28] has pointed out that atopic dermatitis is aggravated frequently by upper respiratory or other types of intercurrent infections. In adults, the development of dermatitis is antedated ordinarily by that of pruritus and many of the features of the clinical reaction, such as lichenification, may be explained by the trauma of rubbing or excoriation. Erythema and swelling are seen but rarely as primary features in the syndrome as it occurs in adults. It should be recalled also that the pruritus of this syndrome may be variably improved by antihistamine drugs. This would suggest that liberation of small amounts of histamine-like substances is a feature of the syndrome. If this assumption is correct, the aggravating effect of psychosomatic factors, particularly those associated with tension states, may be in part explained. The work of Milhorat[29] has suggested that in tension states, increased amounts of cholinergic substances are present in the circulating blood. It is known also that acetylcholine iontophoresis may potentiate the development of the histamine wheal. It would appear, as Brunner[30] has suggested, that acetylcholine liberated at the ends of cholinergic nerves may have a synergistic effect with histamine produced by a local antigen-antibody reaction, with the resultant development of the clinical atopic syndrome. Presumably, the potentially reactive skin of the atopic individual may be influenced later by various types of secondary injury, although supervening contact sensitizations (except to pollens such as ragweed) are said by Brunsting[31] to be relatively infrequent.

In adult life, the dry, lichenified type of atopic dermatitis is associated commonly with disturbances in the life situation, and the exudative type with the supervention of local and focal infections. In other patients who have had atopic dermatitis, localized eczematoid reactions may later develop; presumably, these have the same etiologic connotations as are present in eczemas of the hands, to be presently considered. Finally, may lichen Vidal be considered as a localized type of atopic dermatitis, or is it a distinct entity as suggested by Hill and Sulzberger?[32] In the light of the previous discussion this would seem to be an elementary question. Lichen Vidal is the direct result of pruritus and excoriation. Prolonged local pruritus may develop in the atopic or nonatopic individual, but a recent study[33] has indicated that disturbances in the life situation are of primary importance.

The eczematous lesions of the hands have been discussed recently by several groups of investigators.[21, 34 a, b, c] As a rule, this condition develops primarily as a contact sensitization or chemical dermatitis, a dermatophytid, a psychogenic dyshidrosis or a food allergy. More occasionally, it may begin as a local infection or as a secondary autoeczematous manifestation of any extensive dermatitis. Rarely, it may assume initially the characteristics of nummular eczema. From their bodily location, the hands are especially susceptible to various types of injury; in consequence, mechanical or chemical trauma, vasomotor instability aggravated by endocrinologic changes at the menses or by climatic variations, are frequently superimposed. The resistance of the skin to secondary infection is then lowered; finally, secondary sensitization to the products of bacterial decomposition may supervene. Considering the interplay of these various etiologic agents in any given patient, the recalcitrance of the eruption to available therapeutic procedures can be readily appreciated.

The importance of psychosomatic factors in the development and aggravation of the eczematous dermatoses is now accepted by most dermatologists. Disturbances in the life situation may influence the skin through various mechanisms, many of which are still incompletely understood. Histamine may be liberated locally, acetylcholine may be released, or severe hyperhidrosis may be produced. Vascular dilatation or spasm are commonly encountered. Finally, as Kapecs and Brunner[35] have demonstrated, transudation and exudation may be greatly facilitated by psychic trauma. The potential influence of these various factors on the development and aggravation of dermatitis needs, I think, no further elaboration.

During the past 2 years, Esplin and I[9] have

been investigating the phenomenon of autoeczematization and to date some 50 patients have been studied. On the basis of preliminary findings, it is believed that patients with autoeczematization become sensitized to a water-soluble fraction of their own epidermal cells. It is not assumed that this sensitivity alone is responsible for the autoeczematous reaction; specifically, local infection may have an important potentiating effect, or localized applied drugs to which sensitization has developed may be absorbed into the general circulation, either as such or as conjugated antigens. The question naturally arises whether it is possible to apply the mechanisms involved in the concept of autoeczematization to such clinically distinct entities as atopic dermatitis, nummular eczema, eczematized seborrhœic dermatitis and eczematous lesions of the hands. Pertinent reference may be made here to the work of Simon[36] on atopic dermatitis. On the basis of his investigations with dander extracts, Simon believes that atopic dermatitis is primarily a sensitization reaction to autogenous epidermis. It is a little difficult, however, to accept this concept in its entirety, for it is not clear how such sensitization could develop in the absence of demonstrable inflammatory lesions, and produce the pruritus which antedates so frequently the first appearance of dermatitis. It is a well-known fact that the treatment of seborrhœic dermatitis should include measures to correct the excessive scaliness of the scalp. When the scalp has been neglected, lesions of this disease are especially common in the eyebrows, the folds lateral to the alæ nasi, the forehead and the retro-auricular areas. It is possible that this circumstance is due in part to dander allergy, since scales from the scalp collect frequently in these areas. In infants, location of the lesions of atopic dermatitis in areas in frequent contact with the mother's scalp has been noted by Simon. Regardless of the possible importance of dander sensitization as a primary etiologic factor in various types of eczematous dermatoses, autoeczematization is well-recognized as a complication in these various syndromes. It occurs most commonly, it is true, as a complication of stasis or contact dermatitis, but has been seen also in eczematous processes of the atopic, seborrhœic or nummular types.

SOME DEFICIENCES IN PRESENT KNOWLEDGE

A survey of the preceding pages indicates only too clearly the many deficiencies in our present knowledge of the pathogenesis of the eczematous dermatoses. In the first place, more information is needed concerning the factors which predispose to the development of contact dermatitis. The influence of various foods, including the azo-dyes suggested as important in the aggravation of contact dermatitis by Baer and Leider,[37] needs clarification. Even more important is an investigation of the factors determining "hardening" and those predisposing to relapse following the subsidence of the contact reaction. Studies on the various aspects of cutaneous metabolism of the recently healed skin might yield interesting findings. As to the pathogenesis of contact and other fixed cellular sensitization reactions, the utilization of blood leucocytes for passive transfer studies, as in the recent work of Lawrence[38] in tuberculin sensitizations, has interesting possibilities.

Despite sporadic investigations, the nature of seborrhœic dermatitis still remains obscure. Although this condition occurs commonly in areas plentifully supplied by sebaceous glands, histologic study of their structure during the dermatitic reaction frequently reveals no obvious abnormalities. How does sebaceous secretion, and the accumulation of large as compared with small amounts of sebum on the skin, predispose to the development of dermatitis? Moreover, the frequent development of seborrhœic dermatitis during the winter months, and its just as frequent exacerbation in hot, humid weather, has never been satisfactorily explained. In the latter situation at least, a study of sweat function would be of interest. Another question of importance is the influence, if any, of the local bacterial flora on seborrhœic skin, particularly with regard to secondary sensitization phenomena. Again, what is the explanation of the intolerance to various forms of local therapy of the severely eczematized seborrhœic skin? Vitamin deficiencies, particularly of the B complex, have been incriminated as important factors in the production of "eczema", especially that of the seborrhœic type. Crude liver extract, iron and vitamin B complex are used frequently, at times with some apparent benefit, as for example in the report of Gross.[1] However, despite the extensive investigations of Sullivan[39] and others, the rationale for such therapy remains largely empirical.

Despite a massive body of investigative work, the influence of "atopy" on the development of dermatitis is a nebulous concept at best. Atopic dermatitis is well-recognized as a clinical entity, but its essential nature remains a mystery whose unravelling probably must await the development of more fundamental methods of investigation. Dermatoses, clinically resembling this syndrome, are not infrequently misclassified as "atopic" in nature; for example, lichenified flexual dermatitis occurs not uncommonly in old people with no history of atopy and with absence of reactivity to intradermal allergens. Similarly, the nature of the localized dermatitides occurring in "atopic" individuals is not clear, since the only baseline is the variable presence of positive intradermal reactions to substances which are unrelated to the clinical syndrome.

On the basis of presently available evidence, it seems improbable that "nummular" eczema can be explained entirely on an infectious basis. In this connection, Gross[2] has raised the question of the importance of a diminution in sweat (ichthyosis) and sebaceous secretion in the production of this syndrome, and has administered large doses of vitamin A with some improvement in 18 of 24 patients. It seems unlikely, however, that the intense pruritus so characteristic of this syndrome can be due solely to these factors. Experimental studies of this pruritus might yield interesting findings.

In the evolution of these various types of dermatoses, the rôle of autoeczematization, psychosomatic factors and infectious components needs further clarification. The influence of impairment of the metabolic or excretory functions of the skin on the course of eczematous processes is surely an important one, but from its very complexity may be solved only by the combined efforts of many workers and by the employment of new tools of investigation. The study of some of the chemical mechanisms in cellular metabolism by means of some of the newer histologic staining techniques is an almost untapped source of important information.

In summary, let me thank you and express my appreciation for your tolerance of this rambling and perhaps at times not too illuminating discussion. If I have sown but one seed of investigative curiosity, I shall be more than satisfied. At any event, let us be sure that the new generation of dermatologists are not epitomized as were their ancestors by Mencken, whose description of a befuddled man studying an obscure problem was compared to the philosophic detachment of a dermatologist contemplating an eczema.

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As the etiology of sarcoidosis is unknown, criteria of diagnosis are necessary. Careful observations have made it obvious that each of the criteria has needed qualifications, and we are left with a concept of a generalized disease having a typical histological pattern, which runs an asymptomatic course unless extensive tissue involvement is in progress as an organ of small compass is affected.—B. Robinson and A. W. Pound, *M. J. Australia*, **2**: 568, 1950.

ANÆSTHETIC COMPLICATIONS AND THEIR MANAGEMENT*

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THE complications of anæsthesia, be they minor or major, may occur during 3 phases of anæsthesia, *viz.*, during induction, during maintenance, and following the use of an anæsthetic agent. In some instances the type of complication may vary with the anæsthetic technique used, such as inhalation, intravenous, spinal, regional, etc.

During the first phase of anæsthesia or induction the following features may be troublesome:

1. *Struggling.*—This is perhaps more common in robust males who need emergency surgery and who have not been too well prepared with sedation. Whenever possible these patients should be induced with pentothal to obviate struggling or excitement. Tubo-curare can be used also to paralyze the myo-neural junctions.

2. *Breath holding* is the patient's reaction to an irritant. It may also precede laryngeal spasm and so it should be dealt with respectfully. In most cases the inhalation agent is being introduced too rapidly. Lessening the concentration or allowing the patient to take a few breaths of air or oxygen will usually suffice.

3. *Coughing,* like breath holding, signifies irritation and is more apt to occur in heavy smokers. The treatment is the same as for breath holding.

4. *Vomiting* usually occurs in Stage I and Stage II. It rarely occurs in well prepared patients. However in emergency cases the stomach should be emptied or the anæsthetic agent skillfully and quickly deepened past the vomiting stage. Once it has occurred lower the head of the table, turn the patient on his side, aspirate the contents and start over. Minnitt and Gillies[1] in their textbook claim that rubbing the lips briskly with a towel will avert vomiting.

5. *Regurgitation* occurs during surgical anæsthesia with the sudden expulsion of gastric or intestinal contents into the oropharynx. The act is involuntary and is caused by relaxation of the cardiac sphincter and by manipulation of the upper gastro-intestinal tract. Treatment involves the preoperative insertion of a Levine tube. The actual treatment is the same as for vomiting.

6. *Laryngeal spasm* is the bugbear of every anæsthetist. We have all heard that the only consolation about laryngeal spasm is that the spasm will be broken just before death. This is small solace to the man at the head of the table and would be less so to the patient if he knew of the situation at hand. While waiting for laryngeal spasm to subside a dangerous state of anoxia may already have occurred. It is well to remember that complete cerebral anoxia for 10 seconds produces unconsciousness, 20 to 30 seconds causes cessation of electroencephalographic brain waves and 3 to 5 minutes may produce irreversible pathological changes in the cerebrum. So it is wise to move smartly in the treatment of laryngeal spasm and try to force oxygen into the patient. Manual compression of the gas bag with at least a nasal air way in place will force some oxygen past the spastic cords. Blind intubation may be tried. The use of syncurine intravenously (decomethonium bromide) is preferable to tubo-curare and in many instances will relax the cords. Tracheotomy is rarely necessary.

7. *Bronchospasm.*—Bronchiolar spasm during anæsthesia is usually caused by vagal stimulation which may be due to the anæsthetic agent such as cyclopropane or pentothal which are parasympathomimetic in action. Treatment—Changing to a bronchiolar relaxing agent such as ether is of help. The administration of atropine gr. 1/100 intravenously is also useful. Addition of helium to the breathing mixture is helpful in many cases.

8. *Tremors* appear often in one or more limbs and occur most commonly with ether. This tremor always starts in the lips. The tremors may persist to the lower border of second plane, Stage III. These tremors ultimately disappear and there is no need for alarm.

9. *Convulsions* may occur during any inhalation anæsthetic but most commonly with ether and are more frequent in children and young adults. These convulsions commence as twitching of the muscles of the head and neck or limbs. These may give rise to general clonic spasms which soon result in anoxia. Generally speaking, beware of convulsions in hot humid atmosphere. The mortality is about 20% in those with hyperpyrexia. Treatment: (1) As ether is the most common cause, it is best withdrawn from the anæsthetic system. (2) Sodium

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pentothal. (3) Tubo-curare. (4) Raise the head of the table. (5) If hyperpyrexia is present, cold compresses should be applied to the body. (6) 10% glucose in saline intravenously.

During the early minutes of spinal anæsthesia hypotension is to be watched for. It is important to be on the safe side by not allowing the spinal anæsthetic agent to go above the 4th thoracic segment. Above this level the compensatory vasoconstriction of the unanæsthetized parts become inefficient. In other words the remaining spinal vasomotors have been abolished so that compensatory vasoconstriction cannot occur.[2] *Treatment.*—Ephedrine or ephedrine-like compounds intravenously and glucose in saline. Once the condition has occurred the patient should be placed in Trendelenburg position and given oxygen.

When local anæsthesia is administered signs and symptoms may occur, *viz.*, apprehension pallor, nausea, dyspnœa, slow pulse and occasionally tachycardia, syncope. *Treatment*: A barbiturate should be given before the administration of any local anæsthetic agent. The actual treatment is the prompt use of oxygen, administration of intravenous pentothal and Trendelenburg position.

Procaine sensitivity. — Recently Buff[3] has shown that neostigmine methylsulfate given subcutaneously or intravenously may cause cessation of tachycardia when present as result of procaine infiltration. It is probable that the drug abolishes supraventricular tachycardia through the medium of vagal stimulation.

Now a word about avoiding difficulties in intubation. To prevent trouble in intubation it is best to intubate in the second plane of surgical anæsthesia if time is available. Furthermore the common agents used, *viz.*, pentothal for induction and cyclopropane as a follow-up, in themselves predispose to laryngeal spasm unless the anæsthetist waits for the second plane of surgical anæsthesia. If there is need for urgency pentothal plus tubo-curare or preferably syncurine, will relax the cords sufficiently well to make intubation an easy procedure. The reason that decomethonuim bromide or syncurine[4] is preferable is that (1) it mixes more easily with pentothal and (2) it has little tendency to mobilize histamine. Histamine will cause a decrease in blood pressure and bronchoconstriction. (3) Its action is shorter than tubo-curare. It thus is a reliable agent as an adjunct in endotracheal intubation. I have found that a mixture of 2 mgm. syncurine with 10 to 15 c.c. 2½% sodium pentothal given intravenously will relax the cords so that a tube may be inserted and the main anæsthetic agent can be added. This method is particularly applicable to maxillo-facial injuries.

During maintenance of anæsthesia the following complications are to be prevented:

1. *Respiratory arrest.*—This usually happens in deep anæsthesia and is particularly to be watched for in the young and debilitated. *Treatment*—oxygen and intubation if necessary. Too much time should not be wasted intubating the patient; a good air-way and manual compression of the bag will usually suffice. Reliance upon analeptics or respiratory stimulants is questionable. Coramine, metrazol, picrotoxin and alpha-lobeline will not stimulate respiration once a critical state exists. If during a stage of acute respiratory depression an analeptic is given, the state of anoxia is greatly increased, as these analeptics increase the demand of oxygen to the higher centre. The end result of an increased tissue oxygen demand above the available supply is no different from further deprivation of oxygen from an already anoxic patient.

Coramine is frequently recommended as a cardiac stimulant. Physiologists have shown that when coramine is added to Ringer's solution of a perfused rabbit's heart the heart stops in diastole.

2. *Cyanosis* may be part and parcel of respiratory arrest or it may be purely obstructive in the nasopharynx. Adequate aeration must be assured and the tongue pulled forward sufficiently. It is well to remember that in an anæmic patient cyanosis may be absent and yet anoxia will be present. Conversely in a plethoric patient cyanosis may be marked and yet there will be little anoxia because of the high Hb. in the plethoric type.

So in cases of cyanosis and respiratory arrest the situation should be appraised carefully and treatment carried out as mentioned earlier in respiratory arrest.

3. *Shock* may be due to the surgery but the anæsthetist is expected to deal with this problem. The treatment for shock is perhaps too well known for comment but so often the intravenous administration of fluids on the table is too long delayed. If it is known that an operation is going to be lengthy fluids should be started early.

4. *Cardiac irregularities* may be a forewarning

of cardiac arrest or may be more or less harmless as when cyclopropane is used. In the latter regard it is perhaps best to add a small amount of ether to the system as this will often prevent irregularities. For the active treatment of cardiac irregularities one may use 5 c.c. of 1% procaine intravenously. More recently dibenamine[5] (one of the B-haloalkylamines) given intravenously appears effectively to prevent cardiac arrhythmias in patients under all levels of cyclopropane anæsthesia. I have had no personal experience with this drug but its use has been described in the literature recently. Quinidine lactate[6] has also been used intravenously for cardiac arrhythmias.

5. *Cardiac arrest* usually occurs without warning, with the first sign being cessation of pulse at the temple or over the carotid. In some cases pallor and slow or irregular pulse are warning signs. There must be an orderly pattern of treatment in all cases of cardiac arrest: The patient should be placed in Trendelenburg position to increase cerebral circulation. Inflate the lungs with oxygen. Have the surgeon insert a lumbar puncture needle into the right auricle at the lateral border of 3rd right intercostal space. Occasionally the stimulation of the needle will start the heart. If not adrenalin might be tried—½ c.c. 1:1,000 adrenalin. If the heart still has not started the surgeon should institute cardiac massage.

6. *Blood transfusion* reactions during anæsthesia may be more difficult to diagnose than in the conscious patient but flushing of the skin, increased bleeding and increased respiration are fairly indicative signs that the blood should be discontinued.

The above are major complications during maintenance. The post-anæsthetic complications may be immediate or remote. The immediate complications are vomiting, laryngospasm and emergence delirium. The former two are treated in the manner as mentioned earlier in this paper. Emergence delirium is probably more common after cyclopropane anæsthesia than others. Morphine or apomorphine in the dose of gr. 1/30 to 1/60 intramuscularly or slowly if intravenously as recommended by Rovenstine[7] is efficacious.

7. *Cyclopropane shock* is a type of circulatory collapse after the patient returns to the ward. Soon after the cessation of cyclopropane the blood pressure drops. It is thought to be due to CO_2 retention.[8] To avoid this type of complication use small dosages of morphine and barbiturates. Toward the end of the operation large flows of N_2O—oxygen without absorption may well be substituted for cyclopropane.

8. *Atelectasis* usually presents its first symptoms within 48 hours. Increase in pulse rate and increased respiration may be the only early findings. Later the typical physical signs develop. Treatment: Turn the patient frequently, and have him cough. Expectorants and bronchoscopic aspiration of mucous plugs may have to be done.

Other complications postoperatively which are perhaps more common following spinal anæsthesia are headaches, backaches, urinary retention and neurological symptoms.

Headaches usually occur in first 3 days and are more frequently occipital. It is claimed by some that lying flat in bed for 24 hours will avert these headaches; others say that early mobilization has not increased the incidence of headaches. However once the headache has started bed rest, intravenous fluids and analgesics tend to relieve the pain.

Backache is best prevented by using as gentle a technique as possible for spinal puncture and irrespective of type of anæsthetic a small pillow under lumbar region reduces the incidence of backache.

Urinary retention is best treated by encouraging patient to sit or stand up wherever possible. Carbachol usually is of help.

The *neurological complications* fortunately are rare and usually disappear in a few weeks. This is particularly true of VI cranial nerve palsy.

It is interesting that in all these emergencies the surgeon places the utmost reliance on the anæsthetist to keep the patient in good condition. Team work is essential but the surgeon, absorbed in the operation, often little realizes the anæsthetist's difficulties. In this regard it would be well to recall a remark credited to Rovenstine—"A good surgeon deserves a good anæsthetist and a poor surgeon needs one".

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PSEUDOCYESIS

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PSEUDOCYESIS, or false pregnancy, is one of the oldest of well-described medical entities. It has played intriguingly on the minds of many philosophers and famous medical men; and during its long history it has even caused political consternation because of the succession laws. The case reported here was met by the author in the interior of China while serving with the UNRRA Medical Mission. Perusal of the literature suggested the publication of further cases. Before the case history, a summary and correlation of previous reports will be given, with special emphasis on etiology.

Hippocrates[1] mentions 12 cases in his practice in 300 B.C. The term "pseudocyesis" was introduced by Good, in 1823 (pseudo = false, cyesis = pregnancy). Bivin and Klinger[1] published an exhaustive study of 444 cases, including 19 of their own. Rutherford,[2] in 1941, added 7. There are in the available literature 10 more (Goldberg and Schatz,[3] Constantini,[4] Dietel,[5] Jacobs,[6] Steinberg *et al.*,[7] and Daily[8]) which, including this report, will give a total of 462 reported cases. The true incidence of pseudocyesis must be several times greater because it appears that the cases reported in the literature are mainly those in which the patient resisted the diagnosis of one or more of the examining physicians and continued to believe in the presence of pregnancy, or where the condition caused considerable social upheaval or medical curiosity. The fact that Rosensohn[9] found 10 cases which appeared within one year in the Antepartum Service of the New York Lying-In Hospital, and that Rutherford[2] found 7 from 1927 to 1940 in the Boston Lying-In Hospital, speaks for a relatively common occurrence.

Definition and nomenclature.—The best definition appears to be that of Dunbar[10] who states that pseudocyesis is a condition in which a woman firmly believes herself to be pregnant and develops objective pregnancy symptoms in the absence of pregnancy. The condition has been described under several names (spurious, phantom, simulated, fatty, hysterical, imaginary nervous, pseudo-, feigned, and fancied, pregnancy; also meteorism, phantom tumour, and tympanites), each of them attempting to express the author's belief in its etiology. The best known foreign term is "grossesse nerveuse", which is often used in English publications. But true etiological nomenclature is not available because of the lack of knowledge that still surrounds the cause of the condition.

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Etiology.—By-passing the mystical and unphysiological explanations evolved before the modern scientific era (wind or water—or a mixture of the two—in the womb, etc.) the most acceptable concept is that it is a *psychosomatic* syndrome (Jacobs,[6] Bivin and Klinger,[1], Durban,[10] Cleghorn[11]). It is, in other words, an interplay of psychical and organic factors and may be found in all variations from an almost unnoticeable psychic factor and full-blown organic changes to a well-developed psychopathic with perhaps none of the organic changes. The unfolding of characteristic physical signs or the existence only of the mental attitude will depend on such factors as age, physical constitution, nutrition, endocrine dysfunction, and on the degree of psychopathic personality. At one extreme may be the woman who appears psychically normal but develops a full and telling picture of the physical signs, and at the other extreme is the woman whose pregnancy exists only behind her psychopathic mental curtain without any physical signs. The case reported in this paper would be the prototype of the first-mentioned, and the many "certified" mental cases would be the prototype of the last mentioned.

The study of the etiological factors can be conducted on two levels: the first is psychic, the second is organic. A *psychic factor* is always present, as the patient's belief in her pregnancy is an essential part of the syndrome. This belief may be primary, based purely on psychic impact; or secondary, based on some organic manifestation. To illustrate this point, the appearance of amenorrhœa can be caused by purely psychic or emotional influences; or amenorrhœa due to organic disorders (malnutrition, debilitating disease, endocrine imbalance, etc.) may initiate psychic changes which, under suitable circumstances will develop into very strong psychic motivations.

The psychic factors of guilt, fear, desire, inferiority complex, sexual maladjustment, antisocial feeling, social insecurities with or without anxiety states, and other emotional influences, are now well recognized as being capable of evoking powerful somatic reactions. In relation to the reproductive organs, several observations can be noted: Loeser reported three cases of amenorrhœa caused by a near-by bomb explosion. Amenorrhœa was widely experienced in prison and especially in the concentration camps of

the last war. Although there was a substantial factor of malnutrition present, it was believed that the sudden and complete absence of menses was in most instances due to emotional factors (Cleghorn[11]). Novak and Harnik,[12], and Miller[13] described suppression of menses as a result of hypnosis.

Menorrhagia and metrorrhagia have often been found to be caused by emotional factors and there are an increasing number of publications on this subject. Recently, Fremont-Smith and Meigs[14] reported a case of long-standing (9 years) uterine bleeding which resisted a long series of hormonal and surgical treatments, but was completely cured by psychiatric therapy, suggesting that the cause was emotional.

In contrast to the general acceptance of the influence of emotional factors, there is a wide divergence of opinion as to the ways these factors act. Most authors suggest that emotional factors result in hypothalamic inhibitions, believing that hypothalamic stimulation is necessary for the release of luteinizing hormones by the pituitary, which in turn start the normal menstrual cycle through their action on the ovaries.

Histological examination of the reproductive organs after great emotional shock and psychic influences have been reported. Stieve[15] found completely atrophied ovaries, while Loeser[16] believed, on the basis of his biopsies, that emotional shock caused the reproductive system to remain static.

Some of the *physical characteristics* are easily explained. The enlargement of the abdomen is at times due to frank obesity, gas formation, splinting of the diaphragm, ascites, tumours, or enlargement of the abdominal organs. Fetal movements can easily be simulated by the action of the rectus muscles and by the movement of the intestines.

More interesting and most baffling is the explanation of those physical signs which are known to be the result of hormonal reactions usually seen in pregnancy or rarely in specific functional tumours. Amongst those should be mentioned the enlargement of the breasts, the typical puffiness and discoloration of the areola, and the appearance of colostrum; the occasional gravidic change of the facial appearance, gait and posture, and the occasional enlargement of the uterus and often of the cervix.

Steinberg[9] made *hormone studies* on two pseudocyetic cases and found there was a definite elevation of the gonadotrophic and œstrogen levels. In the first case there were 1,800 rat units of gonadotropin and 3,000 rat units of œstrogen in the first 24-hour urine specimens; in the second case, there were 35 and 900 units respectively. (Normal excretion is 40 to 60 rat units of gonadotropin and 60 to 90 rat units of œstrogen.) Although these figures are well below the high values of normal pregnancies, they show a shift toward pregnancy. One has to assume that endocrinologically the organism is attempting to prepare for pregnancy.

Recent investigations throw a new light on the relative importance of the Aschheim-Zondek test. It is now known that a positive A-Z test implies the excretion of approximately 1,500 rat units of chorionic gonadotropin. Therefore, a pseudocyetic patient may show a positive A-Z test, as did Jacobs'[6] first patient, and as in five instances mentioned by Dietel.[5] The Guttermann pregnandiol excretion test has not been reported in pseudocyesis.

Animal experimentation. — Publications on pseudocyesis mention, though only in passing, that the condition is common in the lower animals. The fact is that pseudopregnancy in many animals can be produced at will and has been used extensively in experimental physiology. Pseudopregnancy was first induced by mating with vasectomized males, but it was soon found that slight irritation of the vagina would have the same effect. The duration of pseudopregnancy varies according to the species and the quality and quantity of the inducing agent. A slight touch of a small glass rod brought within the lips caused skipping of one complete œstrus cycle in the rat. Generally speaking, the duration under most favourable conditions will be approximately one-half of the duration of normal pregnancy.

It appears quite justifiable to conclude, in agreement with Nicholas,[17] that pseudopregnancy in experimental animals can be regarded as histologically and physiologically identical with normal pregnancy except, naturally, that there is no conceptus present.

In attempting to co-ordinate findings in animal experimentation with those found in the human cases, one has to keep in mind the different reactions of different species, especially if applied to humans. The duration of pseudopregnancy of animals does not parallel that of

humans; in experimental animals, the duration never extends beyond the half term, while in humans it often goes well beyond the expected day (three or more years' duration has been reported). Excretion of gonadotrophic hormones in humans, if one accepts the few reported cases, is well below that of a normal pregnancy, and consequently physiological preparation of the reproductive system is also very primitive—in contradiction of Nicholas' findings in experimental animals.

One thing is certain, we cannot regard this entity as a purely psychologic disorder; most, if not all, the symptoms and signs are the result of real endocrine changes. It is what stimulates these hormone-producing organs that poses the final problem. Paddoek[18] believes the greatest factor is a strong inherent maternal instinct. Psyche most probably could be given final control of those mechanisms, but certainly not at will. There are millions of women who are most desirous of becoming pregnant, but relatively few will become pseudocyetic. Many more investigations will be needed before the etiology of this curious condition can be settled.

Diagnosis.—Study of case histories shows that the chief requisite is to keep the possibility of pseudocyesis in mind. A thorough but careful, gentle physical examination, including bimanual with or without anæsthesia, will usually suffice. Difficulty arises in cases of supposed early pregnancy where the subjective and presumptive signs dominate the picture. X-ray may be called upon but cannot be relied upon until after the 12th week (dermoid cyst should be excluded). Results of A-Z or other pregnancy tests should be carefully evaluated and if in doubt, should be repeated for comparison (see also previous discussion on etiology and physiology). In view of reports from reliable clinics, one cannot say that pseudocyesis is not a disease but a false diagnosis (Pajot[1]); but in all fairness, on the establishment of a diagnosis of pseudocyesis, the patient should have further examinations in order to attempt to find the cause of the pseudopregnant changes.

THERAPY

The majority will accept the decision of a competent doctor and will very soon show regression of all the symptoms, including the reappearance of menstruation. Where there are more deep-rooted organic or psychologic changes the therapy will not be as easy. One may have to use hormonal therapy or to combat malnutrition and chronic debilitating diseases which, although not a constructive part of the syndrome of pseudocyesis, may be associated with it and play some part in the initiation of amenorrhœa and some other symptoms. There is no need for the operative intervention that has been practised in some cases in the past; many if not all of these operations were due to wrong diagnoses. Constantini[4] admits he would have had the same result from the novocaine infiltration of the splanchnics as from a splanchnicectomy performed because of an immense distension of the sigmoid. This author cannot concur even in the necessity of the novocaine infiltration.

Most difficult will be the handling of cases bordering on pure psychosis; these require competent and lengthy psychiatric treatment.

The following report shows three remarkable features: (1) It is one of the most typical cases. (2) The major part of the abdominal enlargement was due to a greatly enlarged spleen. (3) The patient was a Chinese and apparently only one other case has been reported among the yellow races (Krummacher, 1906[19]).

CASE REPORT

The patient, a chinese female aged 24 years, was admitted to the Obstetrical Service of the Kweilin Provincial Hospital on April 18, 1947. Her chief complaints were slight lumbar discomfort, beginning of labour pains, and being past her expected date of delivery.

The patient had had her last menstrual period on May 27, 1946, which made the date of expected delivery March 4, 1947. She first felt fetal movements on September 25, 1946, but had failed to notice any movement since January, 1947. Slight lumbar discomfort was felt for the last few days and she believed this was the beginning of labour. She visited the Outdoor Clinic the day before admission and was advised to be admitted for what was believed to be missed abortion. She had occasional vomiting and nausea during the first trimester and had slight œdema of the ankles. There was no dizziness, no visual disturbance.

Menarche was at 16, with regular 30-31 day cycles of 7 days' duration, amount was moderate and there was no dysmenorrhœa. She was married at 19 and had never been pregnant before. Her past history was not remarkable except for several attacks of malaria, but she had no such attack during the last six months. Her husband was apparently healthy and there was no family history of hereditary disease. Systemic inquiry was negative.

Physical examination showed the following significant findings. Breasts were well developed, nipples dark and erectile; the primary areola appeared darkened and puffy; no colostrum could be expressed. The abdomen was protuberant and rigid; some striæ gravidarum was present. The protuberance corresponded in size to a 7 or 8 month pregnancy but no outline of a pregnant uterus could be made out. The umbilicus was slightly drawn in. The liver and spleen were not palpable on account of the rigidity. Percussion was resonant except for an area which corresponded to an enlarged spleen and reached four fingerbreadths below the costal margin. After gentle and persistent attempts, it was possible to

get sufficient relaxation of the abdominal wall. It was well padded and there were no masses to be felt apart from an enlarged, firm spleen. There was no tenderness. Abdominal circumference at the umbilicus was 87 cm. Extremities showed no œdema or varicosities.

Gynæcological examination.—External genitalia were normal, no discoloration seen. Entrance was nulliparous, two fingers could be introduced with some difficulty. Cervix was firm, conical; cervical os felt nulliparous. Body of uterus anteverted and anteflexed, of normal size, moved freely. Adnexa negative. Laboratory examinations showed moderate anæmia, otherwise no remarkable findings.

The diagnosis was (1) pseudocyesis, (2) chronic malaria, (3) primary sterility.

Therapy and progress.—The physical findings were carefully presented to the patient, together with an explanation of her false belief in her pregnancy. She was put on a balanced diet and anti-anæmic medication. There was no appreciable change in the abdominal enlargement but the patient ceased to complain of distension or of the pains which she had believed to be labour pains.

COMMENT

This is a typical case of pseudocyesis. The patient had firmly believed that she was pregnant and entered the hospital for delivery. She had been married for five years, had regular sexual relationship with her apparently healthy husband. To this woman of low intelligence (a servant of the coolie type), the occurrence of amenorrhœa had only one meaning, and that was that she was pregnant. Her desire to bear children was deep-rooted, as I believe that of all races the Chinese women are most anxious to bear as many children to their husbands as they can. While her low intelligence had probably contributed in some degree to the evolution of her pseudocyetic condition, the mental capacity as such, (according to the large series of Bivin and Klinger), cannot be given a definite rôle in the etiology. Paddock,[18] from his study, believes the condition is more frequent in women of limited mental capacity.

The young intern on the service was easily misled by the patient's statements and her appearance. On making his examination, he reported the fundus as seven and one-half centimetres above the umbilicus. But he added that the position of the child was not clear, the fetal heart sound was not heard, and the presentation could not be made out. He made a diagnosis of pregnancy with missed abortion. Concerning this, I would quote from DeLee and Greenhill:[20] "Pseudocyesis has even baffled the diagnostic ability of the ablest surgeons and obstetricians".

Psychological consultation was not available, but it can be stated quite definitely that she was not a case of psychosis. It seems that the appearance of amenorrhœa was not psychogenic but based on constitutional defects due probably to malnutrition and anæmia. The psychic factor entered into the picture after the experience of amenorrhœa and its action through the hypothalamus helped in the development of the other signs and in the maintenance of the amenorrhœa by the outpouring of increased pituitary hormones. Unfortunately, follow-up was not available as the patient lived far out in the country.

Further investigation would have been necessary to establish with more certainty the cause of the amenorrhœa and sterility, but nothing more was done because of the indifference of the patient after her great disappointment in our findings.

SUMMARY

1. Pseudocyesis is discussed primarily from the point of its etiology and physiology.

2. A case is reported and commented upon.

ADDENDUM

A case of pseudocyesis was presented recently at the weekly clinical conference of the Royal Victoria Montreal Maternity Hospital.

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Public opinion is always in advance of the law.—John Galsworthy.

The world belongs to the Enthusiast who keeps cool.—William McFee.

STUDIES ON POLIOMYELITIS IN ONTARIO*

IV. Further Observations on the Spread of Poliomyelitis and Coxsackie Infections In Small Communities

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DURING the past 2 years we have been conducting a field study of poliomyelitis and Coxsackie infections§ in a predominantly rural part of Ontario known as Dufferin County.[1, 3, 5] The method of approach involves inquiry by a whole-time field worker (M.P.A.) into the probable source of infection of cases of poliomyelitis sufficiently ill to require a visit from their family doctor. Our findings in the first year suggested that infection was often traceable to a period of close contact with a person suffering from the abortive or "minor illness" type of the disease.[5] These persons, who were usually ambulant throughout their illness, suffered from some or all of the following symptoms: headache, fever, drowsiness, vomiting, constipation, irritability, change in temperament, tremor and muscle pain.

In the second year of the study (1949) we continued our investigations along the same lines and arrived at similar general conclusions. Two observations of particular interest will be described in this paper. First, it was found that infection with the Coxsackie virus may simulate the minor illness type of poliomyelitis. Some of these findings have already been published in a preliminary form.[1, 3] Secondly, it seemed that outbreaks developed in the study area following the introduction of virus by infected persons from other localities. In addition, this paper describes a search for cases of poliomyelitis occurring in the winter months.

LABORATORY INVESTIGATIONS

Laboratory tests are essential in a study such as this, for it is now well recognized that a clinical diagnosis of the less severe forms of poliomyelitis can only be regarded as tentative. Clinical features identical with those found in poliomyelitis may occur in infection with the Coxsackie and mumps viruses and, in certain parts of North America, St. Louis and equine encephalomyelitis infections have also to be considered.

The laboratory investigations were designed primarily to demonstrate Coxsackie or poliomyelitis virus in stools and to exclude the presence of infection with mumps virus. Stools were obtained from patients as soon as possible after the onset of illness and stored in a portable dry ice cabinet within a short time of collection. Eventually, the specimens were transferred to storage at the virus laboratories. Extracts were prepared for inoculation in monkeys and suckling mice by the following method: A 10% watery suspension was made and then centrifuged at approximately 4,000 r.p.m. on a horizontal centrifuge, the "low speed deposit" being saved. The supernatant was then subjected to ultracentrifugation in the "Spinco" centrifuge at a force of 170,000 gravity. Both the "high speed deposit" and "high speed supernatant" were saved. The high speed deposit was rendered bacteria-free by shaking with ether and, if necessary, penicillin and streptomycin were added. The low speed deposit and the high speed supernatant were pooled, and rendered bacteria-free by ether and antibiotics.

Rhesus monkeys received 0.4 ml. of the high speed deposit in each thalamus, and the other fractions in the peritoneal cavity. The animals

The Field Studies were aided by R. V. McGee, M.D., C. I. Scott, M.B., E. G. Johnston, M.D., C.M., W. J. McLean, M.B. and W. Berwick, M.B.

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§ This virus was first recovered by Dalldorf and Sickles (*Science*, **108**: 61, 1948) from the stools of 2 persons in the Village of Coxsackie, New York. The virus has since been isolated by many other workers and appears to be associated with various clinical conditions, some of which simulate closely the abortive and non-paralytic varieties of poliomyelitis. The virus is identified in the laboratory by its characteristic property of infecting suckling mice and not adult mice.

were carefully examined after inoculation and were killed on the first day of paralysis or after 4 weeks. Histological examination of the brain and cord was carried out in all cases, and the final diagnosis was based on finding the microscopic changes typical of poliomyelitis in the monkey. Since ultracentrifuged material was used, in general it was considered sufficient to inoculate one monkey per specimen.

Suckling mice aged 2 to 4 days were inoculated cerebrally with the high speed deposit, one litter being used per specimen, to test for the presence of Coxsackie virus. The mice were examined closely and were sacrificed at the first sign of infection, which was usually a definite sluggishness of movement, less commonly paralysis. The brain was fixed in formalin and the remainder of the body in Zenker's fluid. The final diagnosis was based on finding the characteristic myositis and associated changes in skeletal muscle. More recently, suckling mice have been fixed entire, so that a complete histological examination can be made. It appears as if our Ontario strains of Coxsackie virus affect predominantly the skeletal muscles without causing changes in brain or viscera.

Blood sera were separated in the field laboratory and stored in a dry ice cabinet. Because of our negative findings in previous years, it was not this year considered necessary to test samples for neutralizing antibodies to the St. Louis, equine encephalitis, or lymphocytic choriomeningitis viruses.[2, 4, 5] However, as it has been reported that the encephalomyocarditis (E.M.C.) virus may cause febrile illness, neutralization tests were performed to exclude infection with this agent.[6] The test involved the intraperitoneal inoculation of adult mice with a mixture of patient's serum, usually undiluted, and not less than 125 LD_{50} of virus. No evidence was obtained that any serum neutralized the E.M.C. virus. Several sera were kindly tested by Drs. W. and G. Henle for the presence of mumps complement fixing antibodies. In no case did the results suggest that the illness in question was a manifestation of mumps infection.

The application of the above tests enabled us to make a presumptive diagnosis of poliomyelitis or Coxsackie infection. Such a presumptive diagnosis was considerably strengthened if the serological test for mumps was negative. In some cases, both poliomyelitis and Coxsackie viruses were recovered from stools and in such instances we were unable to decide which of the viruses was responsible for the clinical condition.

Findings in the Summer Study, 1949

Organization

The organization of the summer study was similar to that used in 1948, but a considerable improvement was effected by the field worker living in the County during the months of July, August, and September. Cases of suspected poliomyelitis came to her notice through the following channels: (1) By direct report from the local physician or medical officer of health. (2) From the health unit nurses. (3) Directly from parents. (4) By weekly clinics held in the towns of Orangeville, Grand Valley, and Shelburne for the purpose of checking the health of school children. Immediately on being informed, the field worker visited the home and examined the patient; specimens of stools, throat washings, and blood (when possible) were then collected from the sick person and his family contacts. Inquiries were made regarding the recent activities of the case, and human contacts were questioned with a view to tracing the probable source of the infection. In some instances infection appeared to have been contracted when on holiday outside Dufferin County, and in such cases it was not possible to make such detailed inquiries.

General Description of Outbreaks

Three separate outbreaks of poliomyelitis were investigated in 1949, one each in the towns of Orangeville and Shelburne and the third in the village of Honeywood. A clinical diagnosis of poliomyelitis was made in 38 cases distributed according to type of illness as follows: bulbar, 5; spinal, 3; non-paralytic, 1; and minor illness type, 29. In addition, 2 persons suffered from a mild non-specific type of illness eventually shown to be associated with the presence of Coxsackie virus; 5 healthy family contacts were also investigated. As in the previous year, all the cases of minor illness were discovered by the field worker, and would not otherwise have been detected.

The stools of 40 of the 45 persons mentioned were tested for the presence of Coxsackie and poliomyelitis viruses, with the results shown in Table I. It will be seen that poliomyelitis virus

TABLE I.

VIRUS RECOVERIES ACCORDING TO CLINICAL HISTORY

Clinical diagnosis of patient's illness	*Number investigated for both poliomyelitis and Coxsackie virus in stools*	*Number excreting poliomyelitis virus only*	*Number excreting Coxsackie virus only*	*Number excreting both viruses*	*Number failing to excrete either virus*
Bulbar or spinal poliomyelitis	5	4	0	0	1
Non-paralytic poliomyelitis	1	0	0	1	0
Minor illness	27	6	3	1	17
Healthy family contact	5	1	0	1	3
Probable Coxsackie infection	2	0	1	1	0
Total	40	11	4	4	21

was recovered from the stools of 5/6 of the bulbar, spinal, or non-paralytic cases, but from only 7/27 of the minor illnesses. There were 3 recoveries of Coxsackie virus from cases of minor illness, so that from 17 of these cases neither poliomyelitis nor Coxsackie virus was recovered. A number of serological tests for mumps or E.M.C. infection were performed, but all were negative.

Investigation by the field worker revealed that in many instances infection appeared to have been contracted by contact with a previous sufferer, often a person with a minor illness. Furthermore, the infection seemed in some cases to have been acquired when on vacation away from the study area, or following a visit by an infected person from another part of North America. The full details of the three outbreaks are given in Tables II, III, and IV.

The Orangeville oubreak.—This outbreak involved 12 persons, 1 suffering from the bulbar, 1 from the spinal, and 10 from the minor illness type of the disease (Table II). The laboratory tests showed that one of the minor illness cases

TABLE II.

CLINICAL POLIOMYELITIS AT ORANGEVILLE

Patient	*Sex*	*Age in years*	*Date of onset*	*Clinical diagnosis*	*Interval between onset and stool collection (in days)*	*Laboratory results*				*Remarks on probable source of infection*
						Recovery of virus from stool		*Serum tests for E.M.C. virus*	*Serum tests for mumps virus*	
						Polio-myelitis	*Cox-sackie*			
B.S.	F.	7	"Dromedary" July 1 and 7	Minor illness	21					*
R.H.	M.	8	July 14	Minor illness	3					*
P.W.	F.	3	July 20	Spinal poliomyelitis	3					Spent first half of July in Northern Ontario.
N.N.	F.	10	Dromedary July 25 and 29	Minor illness	10	+	—	—	—	*
Mrs.C.	F.	27	July 25	Bulbar poliomyelitis	17					A niece from 25 miles away had a minor illness 2 days before reaching Orangeville on July 17.
J.S.	F.	10	Dromedary August 5 and 10	Minor illness	6	—	—	—		*
H.MacD.	F.	11	August 9	Minor illness	2	—	—	—	—	*
Mrs.M.	F.	Adult	August 27	Minor illness	6	—	—	—	—	Not traced.
Mrs.McC.	F.	Adult	September 1	Minor illness	5	—	—	—	—	Not traced.
G.N.	M.	6	September 4	Minor illness	7	+	—			In close contact with Mrs. McC. and family on September 1, but all 3 may represent common source infections.
D.N.	M.	7	September 6	Minor illness	5	+	—			
G.W.	M.	2½	September 21	Minor illness	3	—	+			Not traced.

* These children were in close contact, and swam together several times weekly.

(G.W.) was excreting Coxsackie virus only, and one may make a presumptive diagnosis of Coxsackie infection rather than poliomyelitis. From three of the other minor illness cases poliomyelitis virus alone was isolated, and one may make a presumptive diagnosis of infection with this virus. The other minor illness cases were not tested, or failed to yield either poliomyelitis or Coxsackie viruses.

Not much success attended inquiry into the probable sources of infection of 8 of the cases, but P.W., Mrs.C., and the two N. boys seem to have acquired their infection from previous sufferers.

The Shelburne outbreak.—In Shelburne it was possible to trace the sources of infection in most cases, and it seems that 2 epidemiologically independent chains of infection spread in the town (Table III). In addition, there was a third group of cases in which the source of infection was not definitely traced.

As shown in Table III it appears that in the first group of cases infection was transmitted from R.A., a visitor from Chicago, to his cousin P.W., who in turn infected J.H. Then R.H., a brother of J.H. and proved to be a healthy carrier of poliomyelitis virus, introduced the infection into the B. household (B.B., M.B., Mrs.B. and G.B.). Thereafter A.F., R.G. and Miss K. were involved. In this series of 11 persons, poliomyelitis virus was recovered from the stools of R.A., P.W., J.H., R.H., B.B., and A.F., but not from the others. No Coxsackie virus was isolated.

The second group of infections was apparently initiated by the J. family, visitors from the Northern Ontario town of Elk Lake, and infected both by poliomyelitis and Coxsackie viruses. The oldest son (G.J.) developed signs of bulbar poliomyelitis on the journey to Shelburne. Another boy (D.J.) suffered from an attack of vomiting and diarrhœa probably associated with Coxsackie infection. The other boy (B.J.) had 2 illnesses, the first probably associated with Coxsackie infection, and the second more likely caused by poliomyelitis virus. The father was a healthy excretor of both viruses, and the mother suffered from a very mild illness probably due to the Coxsackie virus. On arrival in Shelburne the family was quarantined for one week in the home of the S family. We have no evidence that Mr. or Mrs.S. were infected by the J. family, but their daughter R.S. developed a minor illness probably due to the Coxsackie virus. Incidentally, it may be mentioned that R.S. became a transient fæcal carrier of poliomyelitis virus shortly after the arrival of the J. family, but this carriage ceased before she developed the minor illness.[1, 3] Also involved in this chain were A.O., who was a playmate of the boy B.J., and L.MacL. a close contact of R.S. A.O. was found to be excreting both viruses and either one may have been responsible for her aseptic meningitis. L.MacL. however was found to be excreting only Coxsackie virus and may be presumed to have been infected therewith.

In the third group, the sources of infection of K.T., Mrs.F., J.F., and Mrs.E. could not be traced. The girl M.L.H. was a sister of J.H. and R.H., and a close contact of R.S., so may have been infected from either source.

The Honeywood outbreak.—The details of this outbreak are shown in Table IV. D.McL. was probably infected when spending a holiday in a town about 50 miles away, and then transmitted infection to her close friend C.F. The patient A.A. was visited by the mother of D.McL. who may have spread the infection. The T. family lived a few miles outside Honeywood and visited there. They may have acquired their infections from friends who reported symptoms suggesting a diagnosis of poliomyelitis minor illness.

Dromedary Cases

The occurrence of "dromedary" illnesses, where there are two "humps" of fever separated by an interval of normal health, has been regarded as typical of poliomyelitis. Five patients in our series, all children, presented this syndrome, and in four the second period was characterized by a minor illness (Table V). In most previous descriptions the second period of illness has usually preceded paralysis. The period of normal health between the two "humps" varied from 4 to 6 days. No dromedary illnesses were noted in those patients apparently infected with Coxsackie virus only.

Observations on the Incubation Period of Poliomyelitis

There were 4 instances of transmission of infection with poliomyelitis viruses from one person to another in which contact was known to have occurred only over a relatively restricted period (Table VI). In 2 instances the

contact was restricted to a few hours on a single day. The incubation periods in these cases varied from 7 to 9 days. There were of course many other instances where infection was contracted by exposure to another case, but as contact occurred on several days no reliable estimate of the incubation period could be made.

FINDINGS IN THE WINTER STUDY, 1949-50

One of the most interesting features of poliomyelitis in North America is the pronounced

TABLE III.

POLIOMYELITIS AT SHELBURNE

Patient	*Sex*	*Age in years*	*Date of onset*	*Clinical diagnosis*	*Interval between onset and stool collection (in days)*	*Laboratory results*				*Remarks on probable source of infection*
						Recovery of virus from stool		*Serum tests for E.M.C. virus*	*Serum tests for mumps virus*	
						Poliomyelitis	*Coxsackie*			
1st group of cases										
R.A.	M.	2	July 15	Spinal poliomyelitis	4	+	—	—	—	Not investigated.
P.W.	F.	9	July 21	Bulbar poliomyelitis	3	+	—	—	—	R.A. visited P.W. on July 14.
J.H.	F.	7	July 23	Minor illness	4	+	—	—	—	Close contact of P.W.
R.H.	M.		Not sick	Healthy contact	Stool collected August 3	+	—			Brother of J.H.
B.B.	M.	8	August 29	Minor illness	16	+	—			Close contact with R.H.
M.B.	M.	4	September 1	Minor illness	2	—	—			Family contact of B.B.
Mrs.B.	F.	Adult	September 1	Minor illness	13	—	—			
G.B.	M.	6	September 3	Minor illness	11	—	—	—	—	
A.F.	M.	5½	Dromedary Sept. 3 and 7	Bulbar poliomyelitis	10	+	—			Close contact of B. family.
R.G.	M.	4	September 10	Minor illness	4	—	—			Close contact of A.F.
Miss N.K.	F.	Adult	September 12	Minor illness	1	—	—			Close contact of B. family.
2nd group of cases										
B.J.	M.	2	August 11	Vomiting and diarrhœa						Family group coming from Northern Ontario. No inquiries could be made.
			August 25	Minor illness	Collected Aug. 25	+	+			
D.J.	M.	6 months	August 11	Vomiting and diarrhœa	14	+	+			
Mr.J.	M.	Adult	Not sick	Healthy contact	Collected Aug. 25	+	+			
Mrs.J.	F.	Adult	August 15	Headache only	10	—	+			
G.J.	M.	4	August 18	Bulbar poliomyelitis	Not collected			—	—	
R.S.	F.	Adult	September 4	Minor illness	10	—	+	—	—	Contacts of the J. family.
Mr.S.	M.	Adult	Not sick	Healthy contact	Collected Aug. 25 and 31	—	—			
Mrs.S.	F.	Adult	Not sick	Healthy contact	Collected Aug. 25 and 31	—	—			
A.O.	F.	6	September 12	Non-paralytic poliomyelitis	2	+	+			Played with B.J. September 3.
L.MacL.	F.	5	September 13	Minor illness	10	—	+			Close contact of R.S.
3rd group of cases										
K.T.	M.	17	August 2	Spinal poliomyelitis	7	—	—			Not traced.
Mrs.F.	F.	Adult	August 29	Minor illness	4	—	—			Not traced.
J.F.	F.		August 29	Minor illness	4	—	—			Not traced.
Mrs.E.	F.	Adult	September 16	Minor illness	7	—	—			Not traced.
M.L.H.	F.	14	September 20	Minor illness	3	—	—			Contact with J.H. and R.S.

TABLE IV.

POLIOMYELITIS AT HONEYWOOD

Patient	Sex	Age in years	Date of onset	Clinical diagnosis	Interval between onset and stool collection (in days)	Laboratory results: Recovery of virus from stool: Poliomyelitis	Laboratory results: Recovery of virus from stool: Coxsackie	Laboratory results: Serum tests for E.M.C. virus	Laboratory results: Serum tests for mumps virus	Remarks on probable source of infection
D.McL.	F.	7½	July 31	Bulbar poliomyelitis	4	+	—	—	—	Child with minor illness in town 50 miles away.
Mrs.McL.	F.	Adult		Healthy contact	Collected Aug. 5	—	—			Mother of D.McL
C.F.	F.	10	August 7	Minor illness	2	—	—	—	—	Close contact with D.McL.
A.A.	M.	8	September 1	Minor illness	2	—	—	—	—	Contact with Mrs. McL. on Aug. 14.
N.T.	F.	3	Dromedary August 5 and 9	Minor illness	6	+	—			Contact with friends suffering from minor illnesses on July 29.
R.T.	M.	Adult	August 8	Minor illness	4	—	—	—		
Mrs.T.	F.	Adult	August 11	Minor illness	1	—	—	—	—	

seasonal peak of paralytic illness in the summer and fall, this variety occurring only very rarely in the colder months. It appeared possible to us that the milder forms of the disease unaccompanied by paralysis might actually occur during the winter months without being recognized by physicians. Some 36 families living in various parts of the County, mainly in Orangeville and the large village of Grand Valley, representing 182 persons, were selected for study on the basis of there being 2 or more children per family. Each family was personally visited by the field worker at approximately weekly intervals throughout the winter

TABLE V.

"DROMEDARY" POLIOMYELITIS:

CLINICAL FEATURES DURING BOTH PERIODS OF ILLNESS

Initials and age in years	Dates of 2 periods of illness	Fever	Headache	Vomiting	Drowsiness	Constipation	Anorexia	Nausea	Change in temperament	Myalgia	Irritability	Listlessness (prostration)	Sore or red throat	Hyperæsthesia	Stiff neck and back	Paralysis	Laboratory tests on stools for: Poliomyelitis	Laboratory tests on stools for: Coxsackie
B.S. (7)	July 1 July 7	+ +		+ +	+ +	+ +	+ +			+	+	+	+				Not tested	Not tested
N.N. (10)	July 25 July 29	+ +	+ +				+ +	+	+								+	—
J.S. (10)	August 5 August 10	+ +	+ +	+		+ +	+ +			+	+	+		+			—	—
A.F. (5½)	September 3 September 7	+ +	+ +	+ +	+ +	+ +	+ +								+	+	+	—
N.T. (3)	August 5 August 9	+ +		+ +		+ +	+ +		+ +	+ +	+ +						+	—

TABLE VI.

OBSERVATIONS ON THE INCUBATION PERIOD OF POLIOMYELITIS

Source of infection	Initials of patient infected by contact with source of infection	Relationship of period of contact to the illness in the source of infection	Incubation period in patient infected (in days)
A niece	Mrs.C.	Contact 2 days after niece had developed a minor illness.	8 or less
R.A.	P.W.	Contact only for 6 hours on day before R.A. developed spinal poliomyelitis.	7
B.J.	A.O.	Contact with B.J. only for 2 hours, 9 days after onset of minor illness.	9
D.McL.	C.F.	Contact prior to D.McL. being hospitalized with bulbar poliomyelitis.	8 or more

of 1949 and spring of 1950. By means of these visits, a number of sicknesses with symptoms identical with those of abortive poliomyelitis were discovered. The stools of 15 of these persons were treated as described above, and material concentrated by ultracentrifugation was inoculated cerebrally in monkeys and mice to demonstrate the presence of the poliomyelitis or Coxsackie viruses. The results are given in Table VII, from which it will be seen that in no case was any Coxsackie virus recovered, but poliomyelitis virus was isolated from the stool of one boy aged 10 years who had a minor illness in November, 8 weeks after the last case of the summer outbreak in Shelburne, near which town he lived.

TABLE VII.

LABORATORY INVESTIGATION OF CASES OF WINTER MINOR ILLNESSES IN DUFFERIN COUNTY

Initials of patient	*Age in years*	*Date of onset*	*Date of stool collection*	*Examination of stools*	
				For poliomyelitis virus	*For Coxsackie virus*
Mrs.H.	Adult	October 28, 1949	November 2, 1949	—	—
J.H.	10	October 30	November 2	—	—
Mr.H.	Adult	November 2	November 4	—	—
W.G.	6	November 3	November 5	—	—
T.H.	9	October 28	November 4	—	—
R.G.	4	November 4	November 6	—	—
J.H.	10	November 6	November 11	+	—
M.H.	12	November 7	November 11	—	—
F.H.	9	November 7	November 11	—	—
B.Y.	4	November 16	November 18	—	—
Mrs.M.	Adult	December 4	December 6	—	—
G.B.	5	December 28	December 30	—	—
R.B.	7	December 24	December 30	—	—
Mrs.B.	Adult	December 28	December 30	—	—
Mr.C.	Adult	December 31	January 10, 1950	—	—

DISCUSSION

The object of this investigation is to study the general behaviour of poliomyelitis and poliomyelitis-like illnesses from year to year in a mainly rural area where human contacts are relatively restricted, and it is hoped that over a period of years valuable data will be collected. This paper records a number of interesting observations made in 1949, the second year of the study, and some of these will now be discussed.

Thus, as in 1948 we again found evidence that a common method of infection with poliomyelitis or Coxsackie virus is contact with a previous sufferer or a member of his family. Of the 38 cases of clinical poliomyelitis investigated in 1949, 21 gave a history of contact with a person suffering from an illness resembling one or other of the clinical varieties of poliomyelitis, or with a close family contact. In most instances, the probable source of infection with poliomyelitis was a person suffering from the abortive or minor illness type of the disease. People suffering from this mild form of poliomyelitis are seldom seen by family physicians, and are only discovered in the course of epidemiological inquiries.

In 1949, 27 examples of minor illness were encountered. In 6 of these cases, poliomyelitis virus alone was recovered from the stool, and a presumptive diagnosis of infection with this virus was made. In 3 persons, the Coxsackie virus was isolated, and a presumptive diagnosis of infection with this virus was made. In a tenth person, both viruses were recovered from the stool. It is probable, therefore, that a number of cases of clinical poliomyelitis of the abortive type are infected not with the poliomyelitis but the Coxsackie virus. This finding again emphasizes the value of laboratory tests in the investigation of clinical poliomyelitis. However the diagnostic problem is probably more complicated, because it should be noted that no virus was isolated from the stool in 17 of the 27 cases of minor illness. There would appear to be two possibilities to account for this finding. Thus it may be that in the mild type of the disease a smaller quantity of virus is shed in the stool than is the case in the more severe varieties. On the other hand, these patients may not have been infected with poliomyelitis or Coxsackie virus, but were perhaps infected with some other viral or even bacterial agent. This is a subject worthy of further detailed study.

Another finding of interest was the important part played in the dissemination of infection by visitors from other parts of the country who were infectious during their stay in the study area. In other instances, infection seems to have been acquired during a holiday away from Dufferin County. These observations suggest that the introduction of a strain of virus relatively "foreign" to a community may initiate an outbreak, the affected persons presumably having a low degree of resistance to the strain introduced. Obviously, in North America such exposures to "foreign" strains are much more likely to occur in the summer and fall when travel is at its peak.

Of considerable interest was the epidemic of poliomyelitis in Shelburne, a town of 1,160 persons, where 20 persons suffered from clinical poliomyelitis and 2 from a mild sickness probably due to Coxsackie infection. Of these 20 persons, 17 were residents of Shelburne, thus giving the very high attack rate of 1,465 per 100,000 population. Our inquiries suggested that this epidemic in reality consisted of two separate chains of infection. The one chain was initiated by R.A. a boy from Chicago, and the other by the J. family from Northern Ontario. In this second chain, Coxsackie virus was transmitted as well as poliomyelitis, and some of the victims apparently became infected only with Coxsackie virus.

Finally, one may discuss the implications of our winter study. The fact that many persons suffered from an illness clinically indistinguishable from clinical poliomyelitis of the abortive type was unexpected. However, in only one of 15 cases investigated was poliomyelitis virus recovered from the stool, and the etiology of the others remains in doubt. The possibility that "silent" poliomyelitis infection was in fact occurring in Dufferin County well after the end of the outbreak of clinical cases must be considered. Whether such infections persist in such a small community throughout the entire inter-epidemic season has not been determined. Our findings to date tend to suggest that the "reservoir of infection" exists in the larger urban areas.

SUMMARY

1. A field study of poliomyelitis has been continued in the mainly rural area of Dufferin County, Ontario, 14,000 population.

2. The study has been specially directed toward tracing the source of infection of patients sick with poliomyelitis, and all the inquiries were made by a whole time physician.

3. Laboratory tests were carried out on all patients examined in the field study and thought to be suffering from clinical poliomyelitis. Stools were prepared by ultracentrifugation and the "high speed" deposits were inoculated cerebrally in monkeys and suckling mice. Serological tests were carried out for evidence of infection with mumps or E.M.C. virus.

4. Three separate outbreaks occurred during 1949, involving the small towns of Orangeville and Shelburne, and the village of Honeywood.

5. A clinical diagnosis of poliomyelitis was made in 38 cases, distributed as follows: bulbar, 5; spinal, 3; non-paralytic, 1; and minor illness type, 29. In addition, 2 persons suffered from a mild non-specific type of illness probably due to Coxsackie infection.

6. Inquiry revealed that in many instances infection was acquired by close contact with a previous sufferer, often a person with a minor illness.

7. Of 27 cases of minor illness tested by laboratory methods, poliomyelitis virus alone was recovered from the stools of 6, Coxsackie virus alone from 3, and both viruses from 1. In 17 cases of apparently typical minor illness, no viruses were recovered. The necessity for the use of laboratory tests in connection with such a study is demonstrated.

8. It is suggested that the minor illness should be regarded as a syndrome that may be caused by the poliomyelitis or Coxsackie virus. The suggestion is made that some unrecognized virus may also cause this type of illness.

9. There were several instances where infection seems to have been introduced into the study area by patients infected elsewhere.

10. In the town of Shelburne 2 separately introduced chains of infection spread through the community. In one of these groups poliomyelitis virus alone was transmitted, but in the other poliomyelitis as well as Coxsackie virus was disseminated. The incidence of clinical poliomyelitis in this town of 1,160 persons was 1,465 per 100,000.

11. A number of families in the County were closely studied during the winter of 1949-50 in a search for winter poliomyelitis; many clinically typical minor illnesses were discovered,

but from the stools of only 1 of 15 such patients was poliomyelitis virus isolated. This isolation was made 8 weeks after the last case in Shelburne, near which town the child lived.

12. There is thus the possibility that "silent" infection with poliomyelitis virus existed substantially after the apparent end of the summer outbreak.

We are indebted to Drs. W. and G. Henle of the Children's Hospital, Philadelphia, for carrying out the serological tests for mumps.

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FULMINATING DIFFUSE PHLEGMONOUS GASTRITIS

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THE case to be reported ran its course from apparent good health to death in about forty hours. The diagnosis was not made until autopsy. This is the general experience with this disease. Eliason and Wright[42] say: "Failure to diagnose or benefit two personal cases of diffuse phlegmonous gastritis prompted the writers to investigate the subject so that future cases might, perhaps, fare better". The disease is not rare and not new. The first accurate description appeared in the seventeenth century. Increasingly frequent reports have appeared during the past half century.

Phlegmonous gastritis is a pyogenic infection of the wall of the stomach characterized by inflammation of all the layers but most intense in the submucosa. The streptococcus is the responsible organism in about 75% of cases. Staphylococcus, pneumococcus, *B. coli, B. proteus, B. subtilis, B. Welchii* and others are responsible for the remainder. There are two methods by which the organisms reach the gastric submucosa—local and metastatic. Direct contact with infectious material may occur in such conditions as tonsillitis, stomatitis, purulent bronchitis and dental abscesses. Phlegmonous gastritis is considered by some a manifestation of sepsis with localization in the stomach wall.[51] An epidemic of puerperal sepsis in Prague was followed by some cases of phlegmonous gastritis.[37] Exanthemata have been complicated by this lesion.[1] In the minority of cases there have been associated gastric lesions such as ulcer, cancer, alcoholic gastritis and chemical gastritis.[3, 11, 21, 45, 48] Gastric operations may be followed by this lesion. It has been suggested that postoperative dilatation of the stomach may be a form of gastritis. The majority of cases, however, occur without evidence of a previous gastric lesion or systemic infection.

The stomach is usually involved in an acute, diffuse suppurative process. Occasionally a more localized gastric abscess is encountered. The stomach wall is markedly swollen. The swelling seems to stop abruptly at the cardia and pylorus. The normal shiny, translucent surface is dull and opaque. There may be subserous ecchymosis and peritoneal exudate. The gastric wall is stiffened and rubbery. Section of the stomach shows the wall to be thickened to 3 cm. or more. This thickening is due almost entirely to swelling of the submucosa which exudes purulent material. The swollen, velvety mucous surface is usually intact. It may be covered with exudate and contain smaller or larger ecchymoses. Microscopically, all the coats are more or less involved in an acute œdematous and purulent process which is particularly marked in the submucosa. There are areas of hæmorrhage and necrosis. Whilst in the gross the lesion appears to end abruptly at the pylorus and cardia, in the microscopic the cellular exudate is often found to extend into the duodenum and œsophagus. Gross extension into the duodenum and œsophagus has been recorded.[32, 38] The exudate nearly always extends to and through the peritoneum. Death from toxæmia, however, may occur without evidence of peritonitis. In one-third of Sundberg's fatal cases no peritonitis was found.[23] The infecting organism is usually easily demonstrated in the stomach wall. The

similarity between this lesion and erysipelas has been noted by several authors.

Severe, persistent vomiting associated with upper abdominal pain and prostration is the usual picture. High temperature, pulse rate and leucocyte count are present. The diagnosis is "acute upper abdomen". The differential diagnosis includes perforated peptic ulcer, acute obstructive cholecystitis and acute pancreatic necrosis. Deininger's sign—lack of increased pain on sitting up—is said to favour phlegmonous gastritis rather than perforated ulcer. Fulminating cases may die within hours. Less severe cases may not die for two or three weeks. On only one occasion in the literature has the diagnosis been made prior to operation or autopsy. In a few instances in which x-ray has been used a distended, atonic stomach with loss of mucosal pattern has been demonstrated.

The prognosis is extremely grave: 90% of all untreated cases end in death.[23] It is possible that milder, undiagnosed cases may recover with gastric fibrosis and produce a form of linitis plastica. Recovery by gastric resection may occur in the circumscribed abscess[6] but never in the diffuse form.

Treatment in the past has been unsatisfactory. Fink[40] believes that in the occasional instance of spontaneous recovery drainage has occurred into the gastric lumen through the mucosa. Gastrostomy with multiple mucosal incisions has been suggested.[42] If no localization is found, it is doubtful that any operation on the stomach is justified.

Case Report

Mrs. A.B., aged 64, a moderately obese, white female was awakened at about 7 a.m. on June 28, 1950, by epigastric pain and vomiting. She had had a sore throat for one to three weeks prior to the onset of the present illness. There was no previous history indicative of an intra-abdominal lesion. She had not seen a physician for the past 12 years. Hysterectomy in 1938. The vomiting and epigastric pain persisted and increased throughout the day. A physician was called in the evening. Examination indicated continuous vomiting. Temperature 101°, pulse 92, blood pressure 175/85. There was no apparent jaundice; throat appeared normal; tongue was coated. Examination of the chest revealed no evidence of lesion of the heart or lungs. The abdomen was obese; the epigastrium appeared full. There was acute epigastric tenderness. A tentative diagnosis of gastritis or ruptured gallbladder was made. She was admitted to hospital. At midnight it was noted that the pain and vomiting were much more severe. 8 a.m. —Next day, temperature 104°, pulse 144, respirations 36. 4 p.m.—Pulse 160, respirations 48. Continual vomiting. 6 p.m.—Comatose; upper abdomen rigid. It was noted at this time that the urine contained sugar. Blood sugar 444 mgm. %. A consultant suggested coronary occlusion or ruptured viscus. She died at 2 a.m. next morning. Time from onset to death 43 hours.

Autopsy.—(Dr. R. G. D. McNeely). (1) *Chest*: 500 c.c. straw-coloured fluid in right pleural cavity. Recent infarction anterior two thirds interventricular septum. (2) *Abdomen*: On opening the peritoneal cavity a fibrinous exudate was noted to be lying on the surface of the stomach and great omentum. The appendix and gall bladder showed no evidence of inflammation. The pancreas showed no lesion. When the stomach was opened it was noted that this was the source of the peritonitis. The mucosa was congested throughout its entire extent and there were superficial hæmorrhages present. When the stomach wall was cut across pus poured from the submucosa. The wall was ¼ to ½ inch thick. This had the appearance of an acute phlegmonous gastritis. The remainder of the gastro-intestinal tract showed no lesion. (3) *Kidneys*: Nephrosclerosis.

Microscopic.—Stomach: The glandular elements in the mucosa are separated by œdema and infiltrations of lymphocytes and occasional plasma cells. The submucosa is infiltrated with lymphocytes, neutrophils and scattered plasma cells. In the muscular coat in addition there is marked œdema and necrosis. In the necrotic areas cellular reaction is acute. In certain areas abscess formation is present with total destruction of gastric elements. *Cœliac lymph node*: The architecture is intact but there is considerable œdema.

Comment

It is not known what rôle, if any, the antecedent sore throat had in the pathogenesis of this lesion. There was no apparent previous gastric lesion. The responsible organism was not identified, and 800,000 units of penicillin had no apparent effect. The rôle played by the interventricular septal infarction and hyperglycæmia in this case is not evaluated. The dramatic onset and rapidly progressive downhill course were striking.

In view of the efficacy of the antibiotics in streptococcal infections generally, it is felt that earlier recognition or suspicion of the diagnosis, followed by prompt and adequate therapy, might have altered the course in this case.

Summary

A review of the literature pertaining to diffuse phlegmonous gastritis has been presented. A case report has been included.

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RÉSUMÉ

Les auteurs rapportent un cas de gastrite phlegmoneuse diffuse foudroyante dont le diagnostic, comme il arrive habituellement, fut une découverte d'autopsie.

Cette maladie, pas aussi rare qu'on pense, est une infection pyogénique de la paroi de l'estomac caractérisée par une inflammation de toutes les couches de l'organe mais surtout au niveau de la sous-muqueuse. Dans 75% des cas, le streptocoque est l'agent pathogène en cause, et il atteint la sous-muqueuse de deux manières: invasion directe ou voie métastatique. Il peut exister au niveau de l'estomac des lésions préexistantes mais le plus souvent tel n'est point le cas. Bien qu'elle paraisse se limiter à l'estomac proprement dit, des lésions phlegmoneuses sont parfois évidentes dans le duodénum et l'œsophage. La péritonite est peu fréquente.

Les symptômes habituels consistent en des vomissements graves, persistants avec prostration et douleur à la région haute de l'abdomen. Hyperthermie élevée, fréquence du pouls et leucocytose sont présentes. Comme diagnostic différentiel, on songera à l'ulcère peptique, à la cholécystite aiguë et à la nécrose aiguë du pancréas. Le pronostic est extrêmement grave, et la mort survient dans 90% des cas non traités. Le traitement même s'avère insuffisant, car à défaut de localisation, l'intervention chirurgicale semble peu justifiée. Dans le cas rapporté plus haut, à cause de l'efficacité reconnue des antibiotiques dans les infections à streptocoques en général, on croit qu'un prompt diagnostic suivi d'une thérapie vigoureuse et prompte eut pu avoir une influence favorable sur son évolution.

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A SURGICAL VIEW OF THROMBOSIS AND THE ANTI-THROMBOTICS*

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IN opening a series of four Hunterian lectures upon phlebitis and thrombosis before the Royal College of Surgeons in March, 1906, Warrington Haward[25] said: "It has always seemed to me that our interest in a disease should be in proportion not to the rarity, but to the commonness of its occurrence". That seems to me an equally appropriate opening for today's discussion. To further justify his topic he said, "The remote effects of the disease do not seem to have attracted much attention from surgeons". Today surgeons everywhere are acutely conscious of the importance of this problem. This awareness is attributable in part to attempts to develop a specific therapy and the prominence that the problem has been accorded in the literature. In addition, because of the control of diseases due to infection and the reduction in surgical mortality, death from pulmonary embolism has become a far greater tragedy. An appreciation of the crippling local effects of thrombosis is more recent; Bauer[9, 10] and Birger[15] deserve the credit for calling this to our attention. It should occupy a large place in our thoughts about prevention and treatment.

In spite of the attention that this subject has received in recent years, our fundamental knowledge is still based upon the work of Virchow, Cohnheim and Ribbert, and Aschoff. Virchow, whom Cohnheim calls "the creator of the doctrine of thrombosis and embolism", emphasized the importance of the slowing of the blood stream. He believed that the vessel wall prevented coagulation only when the blood was in motion. Cohnheim and Ribbert were impressed with the necessity for accompanying endothelial damage, and the former linked this concept with that of his teacher Virchow by pointing out that in the presence of retarded circulation it was behind the valve curtains in the veins where blood moved most slowly and in the auricular appendages of the heart that clotting was most likely. He explained this on the assumption that the slow moving blood did not carry sufficient nutrition for the endothelial lining, and that because of poor arterial circulation the vasovasorum no longer nourished the vessel wall adequately. Baum-

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garten in 1877 pointed out that stasis could not be the only factor since a column of blood confined to a portion of vessel by double ligatures could under certain conditions remain fluid for weeks and months, and indeed, might never coagulate. Schmidt then showed the influence of platelets in clotting and thrombosis by the very simple experiment of whipping blood with a glass rod. At about the same time Kohler of Dorpat demonstrated that if blood were withdrawn from the artery of a rabbit, allowed to coagulate into a solid cake, then beaten up, filtered, and 5 or 6 c.c. of the filtrate injected into the jugular vein of the same animal, death occurred from coagulation of the blood within the pulmonary system of vessels, usually before the injection was completed.

As a result of these experiments Cohnheim stated "We know now that when blood passes from a frozen to a liquid condition the transition is attended by the release of a considerable quantity of fibrin ferment". Aschoff determined that eddying of the blood stream was propitious for the laying down of the thrombus. Hueck, Dawbarn, Earlam and Evans showed that an increase in platelet count synchronized postoperatively with the period in which thrombosis was to be feared. It is apparent that much of the information which we have today was available 60 years ago when Cohnheim delivered his lectures on the circulation.

PATHOLOGICAL FINDINGS

In Toronto there has been an awareness of the importance of this problem since the publication of Belt's[11, 12] paper in 1934. He reported that in a series of 567 autopsies on adults made in an 18 month period ending April, 1933, he found 56 cases of pulmonary embolism; 37 of these were of sufficient bulk to reduce by two-thirds or more the pulmonary circulation and therefore were regarded as the cause of death; 40 of the 56 emboli were in medical cases and only 16 in surgical. All but 1 or 2 were multiple, illustrating that pulmonary embolism was not usually a single event; 60% arose in the leg veins. The percentage might have been higher for there was not as a rule consent for a complete examination of these veins. The cases were divided into 3 main groups: first, the heart group comprising 25 cases; second, 16 cachectic patients with incurable disease of which 9 had inoperable cancer; and third, sudden deaths in convalescing patients with a normal life expectance, 15 cases in all, 11 of which were surgical and 4 medical.

Belt called attention to the fact that routine autopsies often failed to demonstrate the lesion, and described the special precautions that were necessary. To emphasize the importance of cardiac function he pointed out that there were 36 instances of venous thrombosis in 83 autopsies on cases of congestive heart failure, and 49 instances of impaired heart function in 56 autopsies where death was due to pulmonary embolism. He recalled that Bloomgart and Wise showed that circulation time is appreciably prolonged in cases of cardiac insufficiency, that the velocity of flow from peripheral veins to the heart is slower than in normal individuals and that venous pressure is increased. He noted that Aschoff pointed out that veins of the lower extremity were the first to suffer retardation of flow when the general circulation lags because of the long column of blood, compression of Poupart's ligament and pressure on the left common iliac vein by the iliac artery. Other factors were, increased intra-abdominal tension and immobilization of the abdomen and legs. In 1939 Plewes[50] published a paper on pulmonary embolism in which he showed that there had apparently been an increase in the incidence of postoperative embolism in the Toronto General Hospital from a figure of 0.06% in 1931 to 0.38% in the year 1936. During this period ordinary beds in the hospital were being replaced gradually with Gatch frames. Patients were allowed to sit quietly and comfortably on these frames postoperatively with the thighs flexed on the abdomen and the legs bent at the knees. A possible relation to the type of anæsthetic used was suggested in that 47% of all the embolism occurred in the 12% of the patients who had received spinal anæsthesia. Other factors noted in most series were also evident, such as the influence of heart disease, cancer and general debility.

WHAT INFLUENCES THROMBOSIS?

While some of the increase in incidence may have been attributable to Belt's interest in the problem, Plewes did call attention to certain things we were doing to patients or perhaps failing to do which might be influencing the incidence of postoperative pulmonary embolism. Other factors which contribute to intravascular clotting are conceded to be, alteration in the physical state of the blood, dehydration, polycythæmia, or anæmia; anæmia bringing about its effect through an alteration in the A:G ratio and the production of a state of cardiac hypotonia. Tissue destruction and infection as well as decreased respiratory movements also play a part.

Let us now consider other factors that may favour thrombosis. Of these the first is trauma. Local trauma in an ordinary sense does not exist in most cases of thrombo-embolism. It has been suggested however, that the contact of vein wall with vein wall that is brought about by resting

upon the calves of the legs in bed may be sufficient to damage the delicate lining endothelium. Once the process of thrombosis has been initiated of course, there at once exists the trauma necessary for a continuation of the clotting process. That tissue trauma predisposes to thrombosis is accepted. One of the most interesting recent additions to our knowledge has come from the work of Heimbecker, Bigelow and Harrison[31] on intravascular agglutination of red cells, the so-called "sludging" of Kneisley. They have demonstrated that these clumps of sludged red cells are found not only in the neighbourhood of the area of local trauma, but throughout the circulation; for example, in the vessels of the cornea when the local injury has been to the leg. These clumps can be seen blocking the capillary spaces and leading to stasis of the blood in the tissues. What relation if any this may have to thrombosis is not known. It is interesting that the tendency to sludging is only slightly diminished by heparin.

Ochsner and De Bakey[47, 48, 49] have stressed the importance of spasm in the production of symptoms. They believe that the presence of vasospasm has a marked influence in the production of œdema. Further, that the œdéma is greatly influenced by the presence or absence of the normal arterial pulsation. Arteriospasm is a common complication of vein thrombosis and may be so severe in some cases as to lead to complete obliteration of the peripheral arterial pulse, and in extreme cases, even to gangrene of an extremity. For this reason and because of its influence on œdema they give sympathetic block an important place in the therapy of thrombosis. There is a difference of opinion as to whether or not the distinction that De Bakey and his associates make between thrombophlebitis and phlebothrombosis is justifiable. There is little doubt that the observations of the writers of some years ago were made upon two types of disease: thrombophlebitis, in which the origin was undoubtedly infection, and phlebothrombosis in which infection had no part. There is little evidence that infection plays a part in any considerable number of cases today. Murray[41] has cultured many thrombi without finding organisms.

PREVENTION OF THROMBOSIS

There is little support for the suggestion that antibiotics are tending to increase the incidence of thrombosis. Certain measures are thought to be of importance in reducing the incidence of postoperative thrombosis. It is unwise to entirely confine patients to bed in the preoperative period. Dehydration should be corrected. Anæmia and low blood volume should be overcome by transfusion, and if necessary, by repeated transfusion over a period of time. One suspects that inhalation anæsthesia is safer than spinal. Tissue trauma should be reduced to the minimum necessary in a particular operation. Bleeding should not be excessive and blood should be replaced as it is lost. The use of constricting dressings on the abdomen and lower chest should be avoided. The application of a supporting bandage after operation is of doubtful value unless supplemented by movement of the extremity. When returned to bed the patient should lie flat or preferably with the head somewhat lower than the feet. Frequent changes of position and deep breathing should be insisted upon and the patient should move himself as soon as possible. Active movement of the feet and ankles should be started with the return of consciousness. The calf muscles have been described by Bauer[9] as "the peripheral heart". In all operations where it is feasible early ambulation is desirable. It has been shown to have no ill effects upon the wound and it tends to maintain an active circulation. No patient should be nursed in the Fowler's position until he is able to move about freely in bed without assistance or preferably to be out of bed part of the time.

In spite of these precautions thrombosis remains a formidable problem. Arthur Allen[4] has stated recently that despite his belief that ligation of veins has proved effectual in preventing large numbers of pulmonary emboli, death from embolism is increasing at the Massachusetts General Hospital. De Takats on the contrary believes that thrombo-embolic disease following surgery has greatly decreased during the past decade. It is undoubtedly true that a great number of these deaths occur in patients with advanced cardiac disease, advanced or incurable cancer and other serious debilitating conditions. Certain kinds of surgery on patients of all ages are however particularly likely to be followed by this complication and it is of greatest worry to the orthopædist. In a 25 month period from November 1, 1947 to November 30, 1949, 956 operations were performed on

the division of orthopædic surgery at the Toronto General Hospital; 25 of these patients developed signs of venous thrombosis, an incidence of 2.5%.[24]

The criteria upon which a diagnosis of thrombosis in veins is made have been laid down by numerous authors and consist of continued fever, a persistent elevation in pulse rate, perhaps restlessness, and so far as local signs are concerned, pain of a spasmodic character, deep seated soreness in the muscles, the presence of Homans' sign, œdema and prominence of superficial veins. The interpretation of these symptoms and signs must vary widely, and results attributed to treatment will be influenced by this variation. Is it true that every patient who is found postoperatively to have some deep tenderness in the calf muscles or slight discomfort on dorsiflexing the foot has venous thrombosis and is potentially a subject for pulmonary embolism and the late complications of deep vein thrombosis? I have been inclined to doubt it and have treated many such patients by simply encouraging activity both in and out of bed and have observed rapid clearing of the local signs. Indeed, who of us has not had similar pain and a local area of tenderness in one of the calf muscles while pursuing our usual activities? On the other hand careful dissection of the deep veins in unselected autopsies is said to have revealed the presence of thrombi in as high as 60% of cases.[20] If it is true that these patients are all potential subjects for serious complications the diagnosis is probably made too seldom.

PRETHROMBOTIC TESTS

The numerous tests devised to predict the onset of thrombosis or to determine the so-called prethrombotic state have not thus far proved reliable. It is pretty generally conceded that the platelet count falls slightly during the first postoperative days, then gradually rises to a maximum on the 10th or 14th postoperative day. While this corresponds to the period in which pulmonary embolism is most likely, it has not been possible to correlate the increase with the incidence of embolism. The heparin tests of De Takats and Waugh-Ruddick seem to offer some promise. The presence of thrombosis decreases the reaction to heparin however, and nearly normal tests have not apparently been proof against the occurrence of thrombo-embolism. Prothrombin estimates have not as yet proved satisfactory either as an assurance that thrombo-embolism would not occur or for the prediction of its onset.

The paper of Cummine and Lyons of April, 1948, in which they claimed that through the detection of a new substance fibrinogen B in the blood of postoperative patients they could predict the onset of intravascular clotting time for the commencement of anticoagulant therapy was exciting. Unfortunately their results have been confirmed only in part. Ryan and Murray in reporting on a small series of cases concluded that fibrinogen B is not found in the blood of normal individuals, but is found postoperatively usually for 2 or 3 weeks following any major operation, although it may be absent in cases that have had lesser operations. The mere presence of fibrinogen B in the blood was in no way prognostic of the onset of thrombo-embolic phenomena although it was suggested that intravascular clotting seemed unlikely to occur unless fibrinogen B was present. Fibrinogen B in the blood associated with clotting time of 3 minutes in one determination did seem to pick out a group of patients in whom phlebitis was likely; 28.6% of this group developed thrombosis. Ryan and Murray found that 85% of cases showed the highest incidence of fibrinogen B in the blood on the 8th postoperative day and that 87% of clotting time in the region of 3 minutes fell on that day. This would be attractive if verified because it would mean that anticoagulant therapy should be effective if not instituted for a few days postoperatively. McClure *et al.* found that the test gave advanced warning of thrombo-embolism in about ¾ of the clinical cases observed. It would appear then that while on a statistical basis thrombo-embolism may be anticipated more frequently in certain groups of patients no satisfactory test has yet been elaborated to predict its occurrence in any particular patient.

VENOUS LIGATION

Dr. John Homans[32] of Boston was the first to suggest and practise ligation of the femoral vein to prevent pulmonary embolism. Since that time it has been done a great many times both as a prophylactic and therapeutic measure by a small group at the Massachusetts General Hospital. They feel that vein ligation may serve also to prevent post-phlebitic sequelæ from incompetent deep veins. It has found

favour elsewhere in the United States, particularly with the New Orleans group led by Alton Ochsner. It was a natural suggestion, on the basis of autopsy findings which demonstrated that the majority of thromboses began in the veins of the feet and calves. In 1937 Rossle[53] reported that in 324 autopsies he found thrombosis of the leg in 88 instances, the process being limited to the calf in 50 cases, calf and thigh in 38. In only 7 was the femoral vein only involved. Newman in 1938 examined post-mortem 100 cases of thrombosis of the leg and found the plantar veins involved in 71, the calf veins in 87, the veins of the thigh in 72. He did not find thrombosis to the femoral vein in any case. On the contrary De Takats states that the statistics of Crutcher and Daniel and Evoy's analysis of their own material leave no doubt that thrombotic occlusions originate above the level of Poupart's ligament in more than ½ of the cases.

Dr. John McLachlin of London, Ontario, has recently done complete dissections of the vena cava, iliac and leg veins in 80 post-mortems, 24 of which were on patients who had had pulmonary emboli. The site of origin of the emboli was found in the pelvic veins in 1 case, the thigh in 14, the leg and thigh in 6 and the leg vein only in 3; 53 distinct sources of origin were demonstrated in the 24 cases. In 13 of the 24 cases more than one site of thrombosis was demonstrated.

Arthur Allen recently summarized their experiences as follows:

> "We have used specific measures to relieve or prevent thrombosis in 3,529 patients, 12 of these died of embolism in spite of these efforts and 2 died of hæmorrhage as a result of anticoagulants. A survey of past and comparable records indicates 97 deaths might have been expected."
>
> He then quotes a report by Roe and Goldthwaite from the Pathological Department of the Massachusetts General Hospital which stated: "First, there is no evidence that embolic deaths have been reduced during the past decade, and actually there seems to be a slight increase in spite of our efforts, and second, of 91 proved fatal pulmonary emboli during this period of time only 10 had received any specific measures to prevent the complication". Dr. Allen says "It is apparent that thrombosis and embolism is increasing. We do not know why but we do not believe it is due to better diagnostic procedures and better records in our institution."

ANTI-COAGULANT THERAPY

Credit for the first attempt to use anti-coagulant therapy should go to Bancroft and Stanley Brown.[6] Their work began in 1928 and Quick became associated with them in 1934. On the basis of the Quick test they thought they were able to divide patients into 3 groups: those with a tendency to bleed, those with normal clotting tendencies, and those with a tendency to clot. They recommended placing the patients who fell into group 3 in the pre- and post-operative period on a carbohydrate and fluid diet, limiting fats and proteins and in addition giving 10 c.c. of 10% solution of sodium thiosulphate intravenously for 3 successive days. I remember being quite convinced that a patient who had had several pulmonary emboli recovered because of this treatment. The anti-thrombin substance which later became known as heparin was discovered by MacLean while working in Howell's laboratories at John Hopkins University in 1916, and in the following year Howell suggested its possible place as a therapeutic measure. Work toward the production of a purified product which could be used experimentally and therapeutically began in Professor Best's laboratories in Toronto in 1929, and in 1933 Charles and Scott produced a product of sufficient purity to permit of its use experimentally. Reports upon the clinical use of heparin appeared almost simultaneously from Toronto and Sweden. The first considerable series of patients treated with heparin postoperatively, 315 mixed cases, was reported by Murray and Best[44] in 1938.

Almost from the beginning there was a divergence in method of administration. Murray began to give heparin by a continuous intravenous method. Crafoord, and he was followed by all other Swedish workers, early advocated intermittent intravenous therapy. Murray has continued to prefer continuous intravenous administration, and to insist upon the frequent estimation of clotting times. This also was abandoned quite early by the Swedish school. The obvious advantage of the continuous therapy is that it enables carefully controlled dosage varied frequently according to the need of the patient. In the early stages of an already initiated thrombosis the heparin requirements are much greater than later. They may change rapidly and what was an adequate dose a few hours before may if continued be dangerous through its tendency to promote bleeding. Furthermore, the effects of various batches of heparin are not always the same. Several have stated and apparently many believe that when the effect of a single dose wears off clotting time may go down to 50% or less of normal for an hour or

so thereafter. The great disadvantages of the continuous intravenous method of administration are obviously the amount of labour required and cost, plus in certain instances, the giving of quantities of fluid which may be beyond the patient's needs. Bigelow has been trying out the Swedish method of administration recently. He believes from his limited experience that it is usually effective to a limited degree, but may not have the same effect in the relief of symptoms. De Takats has used intermittent intravenous injections of 50 to 150 mgm. of heparin given 3 to 6 times a day as a standard procedure for 8 years; in all 15,000 injections. He is at present using intramuscular (deep subcutaneous) injections following a primary intravenous dose and thinks the method ideal for therapy not exceeding 6 to 8 days. More recently the use of heparin in a menstruum has been under investigation by several workers. Reports upon the use of the so-called Pitkin menstruum[30] sound promising.

Since dicoumarol was identified clinically by Stahmann, Hupner and Linck in 1941 and synthesized, it has been used widely as an antithrombotic. Its great advantages are that it is cheap and can be administered by mouth. It acts more slowly than heparin, but once its action has been established its effects are more prolonged. The manner in which it acts has not been proved and it is believed by some to be toxic to the liver. The control of dosage by the prothrombin estimation involves reliable laboratory facilities as inaccuracies may lead to overdosage and disastrous results. Minor over-dosage can be controlled by vitamin K, but a marked tendency to bleed must be combated by the transfusion of fresh whole blood. In general where the dosage has been controlled adequately results have been good. Barker, Kromer, Curran and Waugh in 1945 reported on 1,000 surgical patients given dicoumarol postoperatively. Only 1 died, an inadequately treated case. Among these patients 379 had suffered from a previous pulmonary embolism or thrombosis. The prothrombin levels were kept between 30 and 10% of normal by the Quick method.

In his monograph "Dicoumarol in Clinical Use", Sommar Bruzelius[18] reported upon the clinical use of dicoumarol in 1,656 cases, 1,448 of which were treated prophylactically, 113 therapeutically and 95 either as late prophylactic or early therapy. In the prophylactic group a prothrombin index of 40 to 60 was aimed at, while in those with manifest thrombosis or embolism a level of 30 to 50 by the Lehman modification of the Quick method. He claimed that the incidence of thromboembolism postoperatively fell from 2.8 to 1.5% and that postoperative fatal embolism fell from 0.49% in 2 controlled groups to 0.16%. Bleeding occurred in 4.8% of the whole group; in 4.4% of the prophylactic and 9.7% of the therapeutic. It was profuse, leading to more or less fatal conditions in 13 cases and 2 patients died of hæmorrhage. Bleeding was more frequent and dangerous in the older group. Even in this very carefully controlled series, it was therefore a factor of importance. It must be admitted that we have not got away from the worry of the complication of bleeding following the administration of dicoumarol, and its effects are not anticipated with the same confidence as are those of heparin.

Burke, Wright and Kubik have reported recently upon their experiences with a new coumarin product which they call B.O.E.A. Four times the dosage of dicoumarol by weight is required. More rapid action is claimed as well as more rapid elimination. In cases in which immediate action is desired it is still necessary to start with heparin. Daily estimations of prothrombin time are still necessary.

SUMMARY

In recent years we have learned to apply a good deal of fundamental knowledge regarding thrombosis and embolism to the preoperative and postoperative management of patients. Much of this knowledge has been available for many years and deserved more attention than it received. While the high percentage of patients who were advanced in age or suffered from debilitating or malignant disease seemed to suggest that there has been no reduction in the incidence of thrombosis in some institutions, this is probably not generally true. Our first consideration therefore should be the correction of those states and the avoidance of those things in the pre- and post-operative periods which are either known or are suspected in increasing the tendency to venous thrombosis.

Wholesale ligation of the major veins of the legs as a prophylactic measure has to me always seemed a questionable procedure. In certain patients in whom previous embolic episodes have occurred when this tendency is

not controlled by anti-thrombotics it would appear that vein ligation might be considered. The use of sympathetic block should be kept in mind for certain cases in which venospasm and arteriospasm are unusually severe. Under adequate dosage of heparin, spasm, pain, discomfort and swelling usually decrease rapidly. As suggested by Bigelow recently it may be that one of the important effects of anti-thrombotics is a lessening of the tendency to coagulation of the lymph and encouragement of its absorption. The frequency of post-phlebitic changes, many of which do not manifest themselves for some years, is a strong argument for the use of anti-thrombotics. It is an aspect of the problem which has received too little attention. Although a number of observers have mentioned these sequelæ of thrombosis in their writings, Bauer and Birger deserve credit for emphasizing their frequency and importance. They are of particular concern to the orthopædist because of their frequency following fractures and operations on the extremities.

A survey of the literature which tells of experiences with dicoumarol in large well-organized and equipped clinics makes one wonder if it can ever have a very wide application. If it has proved impossible to avoid overdosage and complications from hæmorrhage under these circumstances, it is surely unsafe at the moment to recommend use of the drug in smaller and less well equipped units. One should be certain that the treatment does not produce complications that are only a little less disabling and less dangerous than the disease itself.

Two great needs are apparent; first, if there is such a thing as a prethrombotic state a simple and reliable test for its detection; and second, a cheap, readily available antithrombotic which can be administered simply, preferably by mouth, and which acts reasonably quickly and is susceptible to prompt neutralization by an anti-substance. Recently at a meeting of students at which this subject was being discussed Professor Best said "When such an ideal anti-thrombotic is discovered it will be very close to heparin, and indeed may be synthetic heparin". That seems to me a reasonable hope and perhaps sound prophecy.

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The American Association of the History of Medicine will hold its 1951 annual meeting in Baltimore, Maryland, with headquarters at the Institute of the History of Medicine of The Johns Hopkins University. The meeting will begin on Thursday, May 3, at 8.00 p.m. and will run through noon, Saturday, May 5, 1951. The program will provide for the presentation of papers on medical history on Thursday evening and Friday forenoon. The Garrison Memorial Lecture will be presented on Friday afternoon, May 4. Arrangements will also be made for visits, during the afternoon session, to places of medical historical interest.

Address inquiries to the Secretary, Dr. Iago Galdston, 2 East 103 Street, N.Y. 29, N.Y.

EXPERIENCES WITH LUNG RESECTION IN PULMONARY TUBERCULOSIS*

(A Review of Sixty Cases)

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FROM 1881 to the end of the century a few attempts were made to resect tuberculous lung tissue, most of which were totally unsuccessful. Following these, the procedure was discarded until about 1935.

Interest in the method was again stimulated by Drs. Dolley and Jones of Los Angeles following the presentation of a paper before the American Association for Thoracic Surgery held in Atlanta, Ga., in April, 1938. In this paper, they presented their experiences with four patients, two of whom were made well and two greatly improved, and they cautiously suggested it as a method of value in carefully selected cases. In the discussion that followed, a few surgeons reported individual experiences with one or two cases. The total number was small.

Two years later, in June, 1940, the same authors again presented the subject to the same Association at the Annual Meeting in Cleveland. At this time, they reported their personal experiences with seven cases and invited full discussion and personal reports of the membership. A total of 19 pneumonectomies were reported. Of this number, 8 died (40.2%), only 3 were considered well, 6 improved and 2 failures. There were 31 lobectomies reported. Of these, 8 died (20.5%), 16 were classified as well, 6 improved and one "uncertain".

Opinion was expressed both for and against resection as a method of treatment in pulmonary tuberculosis, the consensus being in favour of carefully selected cases, but it was obvious that, at this time, no standard of selection or technique existed.

During the subsequent ten years, resection has become a generally approved method of therapy and some standards (although not final) have evolved. In the past few years, large series of cases have been reported by several authors and the total, if known, today would be a rather impressive figure.

We herewith present the experiences with the first 60 cases done at the Nova Scotia Sanatorium, not that they represent a numerically large group from which accurate statistical data can be obtained, but rather that they form some basis for formulating standards of selection and technique. It can be stated at the outset that we have not used resection where collapse therapy had a reasonable chance of success, but have reserved it for those cases where it was practically the only method that offered hope of cure or improvement. Most of the cases could be classified as salvage.

Of the 60 cases, 27 (45%) were males, while 33 (55%) were females. The youngest patient was 7 years of age, and the oldest 51, with the greatest number between the ages of 20 and 30 years (see Table I).

TABLE I.
AGE AND SEX DISTRIBUTION

Age group	*Total*	*Male*	*Female*
0 to 9*	1 or 1.7%	0	1
10 to 19	4 or 6.7%	1	3
20 to 29	30 or 50.0%	10	20
30 to 39	15 or 25.0%	10	5
40 to 49	9 or 15.0%	6	3
50 to 59†	1 or 1.7%	0	1
All ages	60 or 100%	27	33

*Youngest: 7 years. †Oldest: 51 years.

Various indications were accepted for resection. Twenty-two of the cases (36.7%) had failed to be improved or controlled by previous thoracoplasty. These failures were due to coexisting tuberculous bronchiectasis with persistent positive sputum in 11 cases (18.4%). There was a failure of cavity closure in 8 (13.3%) and both cavity and bronchiectasis existed in 3 (5%). Of the total of 14 cases of bronchiectasis under thoracoplasty, in none was the active tuberculous component controlled by the previous collapse therapy. All had a positive sputum at the time of operation.

The remaining 38 cases had received no major collapse therapy. Of these, 10 (16.6%) had tuberculous bronchiectasis in which previous collapse therapy had not been applied and in this group 5 had a negative sputum with control of the tuberculous component at the time of operation. Nine (15.0%) of the operations were

* Read before Annual Meeting of the Canadian Medical Association, Halifax, N.S., June 22, 1950.

† Surgeon, Nova Scotia Sanatorium.
‡ Assistant Medical Superintendent and Assistant Surgeon.
¶ Medical Superintendent.

done for bronchostenosis. Of these, 1 (11.1%) existed in a male and 8 (88.9%) in females. The predominance of bronchostenosis in the female is well recognized. Nine (15.0%) of the cases had basal cavities. Such cavities are notoriously hard to close by any method of collapse. Four (6.7%) had tuberculomas. Three (5.5%) of the operations could be considered elective, 2 (3.3%) were done for a totally destroyed lung and 1 was done for an apical cavity in a child with an adherent lung. This case was accepted for the reason that thoracoplasty would have produced a crippling deformity (see Tables II, IIA, IIB and IIC).

TABLE II.

INDICATION FOR RESECTION

Indication	*No.*	*%*
Thoracoplasty failures	22	36.7
a. Bronchiectasis—tuberculous	11	
b. Cavity persisting	8	
c. Both conditions combined	3	
Bronchiectasis*	10	16.6
Bronchostenosis	9	15.0
Basal cavity	9	15.0
Tuberculoma	4	6.7
Elective	3	5.0
Destroyed lung	2	3.3
Apical cavity in a child	1	1.7
All indications	60	100

*Excluding thoracoplasty failures.

TABLE IIA.

BRONCHOSTENOSIS—SEX INCIDENCE

Male	1 or 11.1%
Female	8 or 88.9%
Total	9 or 100%

TABLE IIB.

BRONCHIECTASIS
PREOPERATIVE CONTROL OF ACTIVE TUBERCULOUS COMPONENT

Active tuberculous component controlled by previous collapse therapy	0
Active tuberculous component controlled without previous collapse therapy	5

TABLE IIC.

BRONCHIECTASIS (including thoracoplasty failures)
ACTIVITY OF TUBERCULOUS COMPONENT COMPARED WITH ULTIMATE RESULT

	Tuberculous component active		*Tuberculous component inactive*	
	No.	*%*	*No.*	*%*
Total	19	100.0	5	100.0
Greatly improved*	9	47.3	5	100.0
Improved†	5	26.3	0	0.0
Stationary	0	0.0	0	0.0
Worse	1	5.3	0	0.0
Dead	4	21.1	0	0.0

*Greatly improved—sputum tubercle bacilli negative on culture. No persisting complications.

†Improved—sputum tubercle bacilli negative or positive. No persisting complications.

TABLE III.

ANATOMICAL REGIONS RESECTED

Region	*No.*	*%*	*No.*	*%*
Right side			34	56.7
Entire lung	9	15.0		
Upper lobe	11	18.3		
Upper and middle lobes	4	6.6		
Middle lobe	1	1.7		
Middle and lower lobes	2	3.3		
Lower lobe	5	8.3		
Upper lobe with superior segment of lower	1	1.7		
Upper and middle with superior segment of lower	1	1.7		
Left side			26	43.3
Entire lung	11	18.3		
Upper lobe	8	13.3		
Lower lobe	4	6.6		
Lower lobe and lingula of upper	1	1.7		
Superior segment of lower only	1	1.7		
Apical, posterior and anterior segments of upper with superior segment of lower	1	1.7		
All operations	60	100.0	60	100.0

In the series, 34 (56.7%) were done on the right side and 26 (43.3%) on the left. The part or parts resected are tabulated in Table III. Pneumonectomy and upper lobe resections were the most common operations, both being done in practically equal numbers.

Of the 60 cases, 32 (53.3%) were greatly improved. This classification includes the requirements of negative sputum on culture and no persisting complications. Eight (13.3%) were improved and in this classification the sputum might be negative or positive on culture but negative on direct smear and concentration and there were no persisting complications. One (1.7%) was stationary, 4 (6.7%) were worse after the operation and 15 (25.0%) died (Table IV).

Of the 15 deaths, 8 (53.3%) are classified as early deaths, that is, dying within less than two months of operation, and 7 (46.7%) are late deaths occurring over two months from the

TABLE IV.

RESULTS AS OF APRIL 1, 1950

Result	*Totals*	*Date of operation* 1944	1945	1946	1947	1948	1949
Greatly improved*	32 or 53.3%	1	0	2	1	5	23
Improved†	8 or 13.3%	0	0	0	0	1	7
Stationary	1 or 1.7%	0	0	0	1	0	0
Worse	4 or 6.7%	0	0	0	1	0	3
Dead	15 or 25.0%	0	2	2	1	5	5
All cases	60 or 100.0%	1	2	4	4	11	38

* Greatly improved—sputum tubercle bacilli negative on culture. No persisting complications.
† Improved—sputum tubercle bacilli negative or positive. No persisting complications.

date of the operation. The overall operative mortality (within two months of operation) was 13.3% (Table V).

In attempting to correlate the results with the indication for resection, the figures are somewhat confusing, but they do suggest that good results may be expected in the tuberculoma, bronchiectatic, and bronchostenotic group; fair results in the thoracoplasty failures and basal cavities; and poor results in destroyed lungs. In the group of thoracoplasty failures, again the best results were obtained where the indication was for the presence of bronchiectasis alone and the poorest results were obtained when both cavity and bronchiectasis existed together. At this point, it should be explained that it was necessary in many of the cavity cases, under thoracoplasty, to open directly into the cavity and in some to leave cavity wall *in situ* due to the fact that the lung apex was found destroyed and that the upper part of the cavity wall consisted of chest wall and mediastinum. This, of course, caused massive space contamination. As later shown, this type of contamination was, in the majority of instances, quite easily controlled. Only two

TABLE V.

MORTALITY STATISTICS

Status on April 1, 1950	*No.*	*%*
Alive	45 or	75.0
Early deaths (less than two months)	8 or	13.3
Late deaths (over two months post-operative)	7 or	11.7
All cases	60 or	100.0

TABLE VI.

RESULTS CORRELATED WITH INDICATION FOR RESECTION

Indication for operation	*Total*	*Greatly improved†*	*Improved‡*	*Stationary*	*Worse*	*Dead*
Thoracoplasty failure	22 or 100%	11 or 50.0%	2 or 9.1%	1 or 4.5%	1 or 4.5%	7 or 31.8%
Bronchiectasis*	10 or 100%	7 or 70.0%	3 or 30.0%	0 or 0.0%	0 or 0.0%	0 or 0.0%
Bronchostenosis	9 or 100%	5 or 55.5%	1 or 11.1%	0 or 0.0%	1 or 11.1%	2 or 22.2%
Basal cavity	9 or 100%	3 or 33.3%	2 or 22.2%	0 or 0.0%	1 or 11.1%	3 or 33.3%
Tuberculoma	4 or 100%	3 or 75.0%	0 or 0.0%	0 or 0.0%	0 or 0.0%	1 or 25.0%
Elective	3 or 100%	3 or 100.0%	0 or 0.0%	0 or 0.0%	0 or 0.0%	0 or 0.0%
Destroyed lung	2 or 100%	0 or 0.0%	0 or 0.0%	0 or 0.0%	0 or 0.0%	2 or 100.0%
Apical cavity in child	1 or 100%	0 or 0.0%	0 or 0.0%	0 or 0.0%	1 or 100.0%	0 or 0.0%
All Cases	60 or 100%	32 or 53.3%	8 or 13.3%	1 or 1.7%	4 or 6.7%	15 or 25.0%

TABLE VIA.

RESULTS CORRELATED WITH INDICATIONS FOR RESECTION IN THORACOPLASTY FAILURE CASES

Indication for operation	*Total*	*Greatly improved†*	*Improved‡*	*Stationary*	*Worse*	*Dead*
Thoracoplasty failure due to:						
Bronchiectasis	11 or 100%	7 or 63.6%	2 or 18.2%	0 or 0.0%	0 or 0.0%	2 or 18.2%
Cavity persisting	8 or 100%	4 or 50.0%	0 or 0.0%	1 or 12.5%	0 or 0.0%	3 or 37.5%
Combined conditions	3 or 100%	0 or 0.0%	0 or 0.0%	0 or 0.0%	1 or 33.3%	2 or 66.7%
All thoracoplasty failures	22 or 100%	11 or 50.0%	2 or 9.1%	1 or 4.5%	1 or 4.5%	7 or 31.8%

*Exclusive of thoracoplasty failures—see Table VIA.
†Greatly improved—sputum tubercle bacilli negative on culture. No persisting complications.
‡Improved—sputum tubercle bacilli negative or positive. No persisting complications.

patients with totally destroyed lung underwent operation and both of these died. Until methods are improved, it is quite generally accepted that this type of disease should be rejected for primary resection. The details of results are given in Tables VI and VIA.

Of the entire group of 60 cases, only 25 came through without complication of any kind whatsoever. Thirty-five had minor to serious complications. Of this whole group, 10 cases received no concurrent streptomycin and 50 received it. One of the most common complications encountered was spread of disease either with or without fistula. In the 20 total resections, 9 (45%) had spread to the unoperated side, and of the 40 subtotal resections, 7 (17.5%) had spreads with a homolateral incidence of 4 (10%) and a contralateral incidence of 3 (7.5%) (Table VIIA). The cause of these spreads in the total resections was bronchopleural fistula in 5 (55%) and reactivation and over distension in 4 (45%). In the subtotal group, 4 (57.1%) occurred from bronchopleural fistula and 3 (42.9%) occurred from reactivation and over distension (Table VIIB). The most common complication, and the most serious, was bronchopleural fistula, especially associated with empyema and spread. This occurred in 4 (40%) of the non-streptomycin group and 5 (10%) of the streptomycin group. The protective action of streptomycin against this very serious complication is evident. Persisting pleural space without infection existed in none of the non-streptomycin group and in 2 (4%) of the streptomycin group. No pure empyemata without fistula occurred in the non-streptomycin group, but 2 (4%) did occur with the streptomycin group. Bronchopleural fistula without space infection occurred 4 times or in 8% of the streptomycin treated cases and not at all in the non-streptomycin group. It occurred in association with empyema 3 times or in 30% of the non-streptomycin group and 3 times or in 6% of the streptomycin group. Five cases died within 72 hours and so could not be assessed in regard to complications (Table VII).

TABLE VII.

COMPLICATIONS FOLLOWING OPERATION RELATED TO CONCURRENT STREPTOMYCIN TREATMENT

Complication	*No concurrent streptomycin*	%	*Streptomycin given concurrently*	%
Nil	3 or	30	22 or	44
Pleural space obliterated but spread of disease	0 or	0	7 or	14
Persisting pleural space	0 or	0	2 or	4
Empyema only	0 or	0	2 or	4
Bronchopleural fistula	0 or	0	4 or	8
Bronchopleural fistula and empyema	3 or	30	3 or	6
Bronchopleural fistula, empyema and spread of disease	4 or	40	5 or	10
Died in 72 hours	0 or	0	5 or	10
All cases	10 or	100	50 or	100

At the time of operation, 25 (41.6%) of the group had known contralateral disease. Of these, the disease regressed in 10 (40%). It progressed in 7 (28%) and remained stationary in 8 (32%).

The contralateral disease was classified as exudative in 4 cases and of these 2 (50%) regressed, whereas 2 (50%) progressed. Fifteen cases were classified as productive and of these 4 (26.6%) regressed, 4 (26.6%) progressed and

TABLE VIIA.

POSTOPERATIVE SPREADS OF DISEASE

Operation	*Total cases*	*Spreads of disease*		
		9 or 45%		
		Homolateral	*Contralateral*	*Total spreads*
Total pneumonectomy	20 or 100%	4 or 10%	3 or 7.5%	7 or 17.5%
Subtotal resection	40 or 100%			

TABLE VIIB.

CAUSE OF SPREAD OF DISEASE

	Bronchopleural fistula	*Reactivation and over distension*	*Total*
In total resection	5 or 55.0%	4 or 45.0%	9 or 100%
In subtotal resection	4 or 57.1%	3 or 42.9%	7 or 100%
All spreads	9 or 56.2%	7 or 43.7%	16 or 100%

7 (46.8%) remained stationary. Six were classified as mixed exudative productive, and of these, 4 (66.6%) regressed, 1 (16.2%) progressed, and 1 (16.2%) remained stationary. As was to be expected, the softer contralateral lesions did not stand up so well with resection (Table VIII).

TABLE VIII.

FATE OF CONTRALATERAL DISEASE*

Type of lesion	*Total*	*Regressed*	*Progressed*	*Stationary*
Exudative	4 or 100%	2 or 50.0%	2 or 50.0%	0 or 0.0%
Productive	15 or 100%	4 or 26.6%	4 or 26.6%	7 or 46.8%
Mixed exudative productive	6 or 100%	4 or 66.6%	1 or 16.2%	1 or 16.2%
All cases	25 or 100%	10 or 40.0%	7 or 28.0%	8 or 32 .0%

* Excluding deaths not related to tuberculosis.

In our series, the occurrence of bronchopleural fistula was a most dreaded complication. It occurred far too frequently, in spite of the closure of the bronchial stump or stumps with more meticulous care than is usually exercised with non-tuberculous disease where fistula now seldom occurs. Many of the bronchi were found diseased at the site of division which accounts for some of them opening. Again, it has only been during the past year that we have been using constant suction for rapid re-expansion of the remaining lung in the lobectomy and segmental cases. This has given decidedly better results in a number of cases not included in this series.

Nineteen cases developed fistula and of these 9 (47.4%) died. The cause of death was empyema in 2, empyema and spread of disease in 6, and 1 died an operative death from the inspiration of blood through the fistula during a subsequent Schede operation for empyema (Table IX).

Of the 20 pneumonectomies, fistula occurred 5 times (25%); of the 35 lobectomies, it occurred 13 times (37.1%); of the 3 lobectomies combined with segmental resection of other lobes it occurred in 1 (33.3%); and of the 2 segmental resections only, it did not occur at all (Table IXA).

In the series, tuberculous wound infection occurred twice (3.3%), and tuberculous empyema without fistula occurred twice (3.3%). Both of the latter resolved under streptomycin treatment.

Of the 10 cases that received no concurrent streptomycin treatment, 7 (70%) developed serious complications and 6 of these or 85.7% of those that developed complications died, and the remaining 1 was worse following the operation. Of these, 3 (30%) developed fistula and empyema with 2 deaths, and 4 (40%) developed fistula, empyema and spread and all died.

TABLE IX.

BRONCHOPLEURAL FISTULÆ—Deaths

Number of cases developing fistula	19
Number dead	9 or 47.4%
Causes of deaths:	
Empyema	2
Empyema and spread of disease	6
Operative, Schede	1
Total	9

TABLE IXA.

BRONCHOPLEURAL FISTULÆ
OCCURRENCE RELATED TO EXTENT OF OPERATION

Type of operation	*Number of operations*	*Number of fistulæ*
Pneumonectomy	20	5 or 25.0%
Lobectomy	35	13 or 37.1%
Lobectomy and segmental resection	3	1 or 33.3%
Segmental resection only	2	0 or 0.0%
All cases	60	19 or 31.6%

Of the 50 cases receiving concurrent streptomycin, 23 (46%) developed some complication, but many of these were minor and resolved. In 7 of these cases, the pleural space obliterated satisfactorily, but spread of disease occurred, and of these seven, 3 (42.8%) resolved, 1 (14.3%) remained stationary, 1 (14.3%) became worse and 2 (28.6%) died as a result of the spread or reactivation (Table X).

In 2 of the cases of total resection, the pleural space persisted without fistula and remained sterile and caused no symptoms. This condition probably should not be regarded as a complication at all. Empyema without

TABLE X.

FATE OF POSTOPERATIVE COMPLICATIONS RELATED TO CONCURRENT STREPTOMYCIN TREATMENT*

Complication	*Total*	*Resolved*	*Stationary*	*Worse*	*Dead*
	%	%	%	%	%
(*a*) *No concurrent streptomycin*					
Bronchopleural fistula and empyema	3 or 100	0 or 0.0	0 or 0.0	1 or 33.3	2 or 66.7
Bronchopleural fistula, empyema and spread	4 or 100	0 or 0.0	9 or 0.0	0 or 0.0	4 or 100.0
All cases	7 or 100	0 or 0.0	0 or 0.0	1 or 14.3	6 or 85.7
(*b*) *Streptomycin given concurrently*					
Pleural space obliterated, but spread of disease	7 or 100	3 or 42.8	1 or 14.3	1 or 14.3	2 or 28.6
Persisting pleural space (pneumonectomy cases—sterile)†	2 or 100	0 or 0.0	2 or 100.0	0 or 0.0	0 or 0.0
Empyema	2 or 100	2 or 100.0	0 or 0.0	0 or 0.0	0 or 0.0
Bronchopleural fistula	4 or 100	3 or 75.0	1 or 25.0	0 or 0.0	0 or 0.0
Bronchopleural fistula and empyema	3 or 100	2 or 66.7	0 or 0.0	1 or 33.3	0 or 0.0
Bronchopleural fistula, empyema and spread	5 or 100	1 or 20.0	0 or 0.0	1 or 20.0	3 or 60.0
All cases	23 or 100	11 or 47.8	4 or 17.4	3 or 13.1	5 or 21.7

*Excluding deaths within 72 hours.
†Persisting pleural space but no aspirations required (6 months).

fistula occurred in 2 cases and both resolved. Pure empyema without fistula can now be regarded as a minor complication which can usually be controlled easily with streptomycin treatment. This knowledge renders feasible the opening of cavities in destroyed apices, when such procedure is necessary to remove the lobe. The resulting pleural contamination is, as a rule, not hard to control. The truth of this has become more apparent in some of our recent cases not included in this series.

Four of the cases developed bronchopleural fistula only and 3 (75%) of these recovered and the fistula closed without the occurrence of mixed empyema. One has remained stationary and open without empyema to date and none became worse or died. Three developed bronchopleural fistula and empyema, and even of these, 2 (66.7%) resolved and 1 (33.3%) became worse and probably will die, but none have died to date.

Five of the 23 cases developed bronchopleural fistula, empyema and spread of disease, and of these, only 1 (20%) became well, 1 (20%) became worse and 3 (60%) died. This, of course, is the most serious complication of all in resection therapy for pulmonary tuberculosis.

An attempt was made to correlate the occurrence of postoperative complications to the amount of preoperative streptomycin. Some of the cases had received a considerable amount of the antibiotic before operation was undertaken. The figures we obtained are not very significant beyond that the percentage of cases having no complication at all was greatest (55.2%) among the cases receiving 0 to 29 grams preoperatively and became less as the amount of preoperative streptomycin increased; namely, 16.7% where 30 to 59 grams had been given; 40% where 60 to 100 grams had been given, and 30% where over 100 grams had been given. The detail of

TABLE XI.

POSTOPERATIVE COMPLICATIONS RELATED TO AMOUNT OF PREOPERATIVE STREPTOMYCIN

	Total	*Amount streptomycin given before resection*			
		0 to 29 gm.	*30 to 59 gm.*	*60 to 100 gm.*	*over 100 gm.*
	%	%	%	%	%
Nil	22 or 44.0	16 or 55.2	1 or 16.7	2 or 40.0	3 or 30.0
Obliteration of space but spread of disease	7 or 14.0	4 or 13.8	1 or 16.7	2 or 40.0	0 or 0.0
Persisting space	2 or 4.0	1 or 3.5	1 or 16.7	0 or 0.0	0 or 0.0
Empyema	2 or 4.0	2 or 6.8	0 or 0.0	0 or 0.0	0 or 0.0
Bronchopleural fistula	4 or 8.0	2 or 6.8	1 or 16.7	0 or 0.0	1 or 10.0
Bronchopleural fistula and empyema	3 or 6.0	1 or 3.5	0 or 0.0	0 or 0.0	2 or 20.0
Bronchopleural fistula, empyema and spread	5 or 10.0	2 or 6.8	1 or 16.7	1 or 20.0	1 or 10.0
Died within 72 hours	5 or 10.0	1 or 3.5	1 or 16.7	0 or 0.0	3 or 30.0
All cases	50 or 100.0	29 or 100.0	6 or 100.0	5 or 100.0	10 or 100.0

TABLE XIA.

CONTAMINATION OF SPACE

IN RELATION TO STREPTOMYCIN ADMINISTRATION

Operations with space contamination	*Total*	*No complication*	*Fistula and empyema*	*Operative death*
With streptomycin	9 or 100%	5 or 55.5%	3 or 33.3%	1 or 11.1%
No streptomycin	4 or 100%	1 or 25.0%	3 or 75.0%	0 or 0.0%
All cases	13 or 100%	6 or 46.1%	6 or 46.1%	1 or 7.8%

this effect of streptomycin is given in Table XI.

There can be no doubt about the protective effect of streptomycin in cases where the pleural space is either accidentally, or of necessity, contaminated. In this series, there was massive contamination in 13 instances, 9 of which received streptomycin treatment and 4 did not. Of the 4 that received no streptomycin, only 1 (25.0%) had no postoperative complication, whereas 3 (75.0%) developed fistula and empyema. There were no operative deaths. Of the 9 that were treated with streptomycin, 5 (55.5%) had no complication, 3 (33.3%) developed fistula and empyema and there was 1 (11.1%) operative death (Table XIA).

In correlating the occurrence of complications with the amount of lung resected, it was found the greatest number occurred with total pneumonectomy, the next with lobectomy and the least with segmental resection. Of the 20 pneumonectomies, there was no complication at all in only 5 (25%). Of the 35 lobectomies, there was no complication in 17 (48.6%). Of the 5 segmental resections, there was no complication in 3 (60%). Segmental resection has been the most recent introduction in pulmonary resection therapy and we feel that it will be used in an increasing number of cases that were previously treated by more extensive resections. It has many advantages that, at least in theory, are superior to lobe resection and at the same time it makes possible the inclusion of cases for this type of therapy that would otherwise have to be excluded. It is a lung conserving operation. Smaller bronchi have to be closed and the danger of reactivation from over distension of remaining lung is minimized. The detail of complications following the various resections is given in Table XII.

The results in subtotal resection were better than in the total resections. Of the 40 subtotal resections, 23 (57.5%) were greatly improved, 6 (15%) were improved, 1 (2.5%) was stationary and 3 (7.5%) were worse. Four of these (10%) died within two months and are classified as operative deaths, and 3 more (7.5%) died later. Of the 20 total pneumonectomies, 9 (45%) were greatly improved, 2 (10%) were improved, 1 (5%) was worse. Four of these died within two months and again are classified as operative deaths and 4 (20%) died later (Table XIII).

Excluding the patients that died within 72 hours, there were 42 that had a positive sputum previous to operation. Of these, only 20 (47.6%) became negative after the operation. In the 22 that remained positive, there was no apparent reason for failure in 5 (22.7%). In one (4.6%) there was an ulceration of the stump. In 12 (54.5%) the cause of failure was the presence

TABLE XII.

COMPLICATION RELATED TO TYPE OF OPERATION PERFORMED

Complication	*Pneumonectomy*		*Lobectomy*		*Segmental resection*		*All resections*	
		%		%		%		%
Nil	5 or	25.0	17 or	48.6	3 or	60.0	25 or	41.7
Pleural space obliterated but spread of disease	4 or	20.0	3 or	8.6	0 or	0.0	7 or	11.6
Persisting pleural space	2 or	10.0	0 or	0.0	0 or	0.0	2 or	3.3
Empyema only	1 or	5.0	1 or	2.8	0 or	0.0	2 or	3.3
Bronchopleural fistula	0 or	0.0	2 or	5.7	2 or	40.0	4 or	6.7
Bronchopleural fistula and empyema	0 or	0.0	5 or	14.3	0 or	0.0	5 or	8.3
Bronchopleural fistula, empyema and wound infection	0 or	0.0	2 or	5.7	0 or	0.0	2 or	3.3
Bronchopleural fistula, empyema and spread of disease	5 or	25.0	3 or	8.6	0 or	0.0	8 or	13.3
Died in 72 hours	3 or	1.5	2 or	5.7	0 or	0.0	5 or	8.3
All cases	20 or	100.0	35 or	100.0	5 or	100.0	60 or	100.0

TABLE XIII.

END RESULTS OF TOTAL PNEUMONECTOMY AS COMPARED WITH LOBECTOMY AND/OR SEGMENTAL RESECTION

	Procedure	
	Total pneumonectomy	*Lobectomy and/or segmental resection*
	Percentage	*Percentage*
Total	20 or 100.0	40 or 100.0
Greatly improved*	9 or 45.0	23 or 57.5
Improved†	2 or 10.0	6 or 15.0
Stationary	0 or 0.0	1 or 2.5
Worse	1 or 5.0	3 or 7.5
Operative deaths in 2 months	4 or 20.0	4 or 10.0
Late deaths	4 or 20.0	3 or 7.5

*Greatly improved—sputum tubercle bacilli negative on culture. No persisting complications.
†Improved—sputum tubercle bacilli negative or positive. No persisting complications.

TABLE XIV.

CONVERSION OF SPUTUM

Cases—sputum positive for tubercle bacilli before operation	42*
Cases—sputum rendered negative for tubercle bacilli after operation	20 or 47.6%

*Excluding persons dying within 72 hours.

TABLE XIVA.

REASON FOR FAILURE TO CONVERT SPUTUM

Reason	*Number*
No reason apparent	5 or 22.7%
Ulceration of stump	1 or 4.6%
Bronchopleural fistula	12 or 54.5%
Homo- or contra-lateral cavity	4 or 18.2%
Total	22 or 100%

of a bronchopleural fistula, and in 4 there was homolateral or contralateral cavity (Tables XIV and XIVA).

Four of the series had previous contralateral collapse therapy and of these 1 (25%) was greatly improved, 2 (50%) were improved and 1 (25%) died.

Of the 40 subtotal resections, homolateral spread occurred four times. Eleven of these cases had previous thoracoplasty or concurrent and/or previous phrenic paralysis on the operated side, and of this number, homolateral spread occurred in 1 (9.1%). This progressed. Twenty-nine of the subtotal resections had none of the above mentioned collapse measures on the operated side, and of these, spread occurred as a result of over distension of the remaining lung in 3 (10.4%). It progressed in 1 and regressed in 2 (Table XV and XVA).

There were 15 deaths from various causes, 7 of which were unrelated to the presence of pulmonary tuberculosis. Four of them died from complications occurring on the table, 1 died from a transfusion hæmolysis, 1 died following a homolateral thoracoplasty, and 1 of pulmonary embolus following a contralateral thoracoplasty. The time interval and causes of death are listed in Tables XVI and XVIA.

DISCUSSION AND CONCLUSIONS

This series represents the first sixty lung resections carried out between 1944 and the end of 1949 at the Nova Scotia Sanatorium. The youngest patient was seven years of age and the oldest fifty-one.

TABLE XV.

FATE OF PATIENTS WITH PREVIOUS CONTRALATERAL COLLAPSE

Total	*Greatly improved**	*Improved†*	*Stationary*	*Worse*	*Dead*
4 or 100%	1 or 25%	2 or 50%	0 or 0%	0 or 0%	1 or 25%

*Greatly improved—sputum tubercle bacilli negative on culture. No persisting complications.
†Improved—sputum tubercle bacilli negative or positive. No persisting complications.

TABLE XVA.

HOMOLATERAL SPREADS—DEVELOPMENT RELATED TO PRESENCE OR ABSENCE OF COLLAPSE MEASURES TO DIMINISH SIZE OF HEMITHORAX

	Total operations (lobectomy and segmental)	*Homolateral spread*	*Progressed*	*Regressed*
With thoracoplasty or phrenic	11 or 100%	1 or 9.1%	1	0
No collapse: Distension of lung	29 or 100%	3 or 10.4%	1	2
All cases	40 or 100%	4 or 10.0%	2	2

TABLE XVI.

DEATHS—TIME INTERVAL AND CAUSE

Case	*Operative procedure*	*Time of death post-operatively*	*Cause of death*
J.M.	Right total	On table	Cardiac arrest (unknown origin)
E.L.	Left total	On table	Hæmorrhage from pulmonary artery
J.M.	Left total	On table	Primary hæmorrhage (insufficient blood transfusion)
G.Y.	Right upper lobe	On table	Tension pneumothorax?
H.D.	Right upper and middle lobes	3 days	Lower nephron nephrosis (transfusion reaction)
M.S.	Right lower lobe	37 days	Empyema and bronchopleural fistula
A.B.	Left total	38 days	Bronchopleural fistula, empyema, and spread of disease
G.C.	Right lower lobe	53 days	Bronchopleural fistula and empyema
F.J.	Left total	68 days	Postoperative thoracoplasty?
C.T.	Right upper lobe	4 months	Bronchopleural fistula, empyema and spread of disease
M.B.	Right total	19 months	Empyema and spread of disease
D.L.	Left lower lobe	19 months	Empyema and spread of disease
L.D.	Right total	22 months	Postoperative contralateral thoracoplasty
V.M.	Right total	24 months	Spread of disease
B.Y.	Right upper lobe	24 months	Empyema, bronchopleural fistula and contralateral spread of disease

TABLE XVIA.

DEATHS UNRELATED TO PULMONARY TUBERCULOSIS

	Number
On table	4
Transfusion reaction—3 days	1
Postoperative thoracoplasty (homolateral)	1
Postoperative thoracoplasty (contralateral)—pulmonary embolus	1
Total—(46.6% of all deaths)	7

In this series, the main indications for the operation have been thoracoplasty failures due to the presence of bronchiectasis, a persisting cavity, or both; a tuberculous bronchiectasis with persisting positive sputum or serious symptoms such as hæmoptysis; bronchostenosis with peripheral atelectasis; basal cavities which have not responded to more conservative surgical procedures; tuberculomata; and localized cavitary tuberculosis in an age group where a thoracoplasty, otherwise indicated, was considered impractical.

The procedure was performed upon two patients with a destroyed lung and in three cases electively. The former group are not now accepted by us for primary resections.

The best results in this series were obtained when the resection was performed for tuberculoma or for bronchiectasis, either with or without previous thoracoplasty.

Poor results were obtained when both cavity and bronchiectasis existed together in a thoracoplasty failure and results were fair only in persisting cavity cases under thoracoplasty. It is to be mentioned that, due to the extremely firm adhesions found over the apex in thoracoplasty cavity cases, operative rupture of the cavity and consequent gross contamination of the pleural space is more apt to occur and so contribute to the poorer results.

An impression gained from this series is that apical adhesions are less dense in bronchiectasis than in persisting cavities in thoracoplasty failures.

It is felt that those patients receiving large amounts of streptomycin preoperatively are more likely to have serious complications than where this drug can be reserved for this major surgical procedure. This impression may be modified somewhat by experience gained in the use of combined therapy with PAS.

Although each case was bronchoscoped preoperatively to determine the state of the bronchus at the proposed site of division and, when tuberculous endobronchial disease was discovered, it was treated appropriately by streptomycin before operation, postoperative bronchopleural fistula was the most frequent complication encountered. A completely satisfactory method of bronchial stump closure and protection is yet to be devised.

To date, no apparent reason has been found for persisting positive sputum in five otherwise apparently successful cases without demonstrable evidence of cavitation, bronchiectasis or tracheobronchitis.

SUMMARY

A review of sixty cases of lung resection for pulmonary tuberculosis has been reported. The indications for the operation, results obtained, and impressions gained have been presented.

ADDENDUM

From January 1 to June 15, 1950, 31 resections have been completed. These are not i cluded in this series and, of course, are too recent for any real evaluation. However, there have been no deaths to date, and only two serious complications, both of which are improving. This we attribute to improved standards of selection and technique, an important factor being that of rapid obliteration of the pleural space by constant suction drainage.

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THE TREATMENT OF DETACHED RETINÆ*

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ONE might say that since Gonin[1] first advocated closure of the retinal hole for the treatment of detachment of the retina, nothing new has been added, save scleral resection. There are some points, however, too often ignored in the diagnosis and treatment of this condition which are worth emphasizing if one is to envisage a satisfactory operative result. With this in mind I consider it worth while to stress certain procedures which I have found most useful in the treatment of different types of detached retinæ.

Prior to the time of Gonin's historic observation in 1925 that detached retinæ were amenable to cure by the localization and closure of retinal holes, the results had been almost without exception unsuccessful. To quote Duke-Elder,[2] in describing the innumerable methods proposed up to that time: "their number speaking eloquently for their valuelessness".

Gonin revolutionized the treatment of this condition by insisting that the steps in the treatment be, first, the finding of a retinal hole or tear and, secondly, its closure. The stimulus of the success of his original cautery puncture prompted the trial of various other devices to achieve choroido-retinal adhesions in the vicinity of the hole, until, in 1932, Safar introduced a diathermy barrage which, with some modifications, is still the preferred method. Weve[3] of Utrecht and Pischel[4] of San Francisco by the use of carefully controlled diathermy applications along with what Gonin insisted is the most important surgical instrument of all, the ophthalmoscope, have proved that cures can be affected in better than 80% of all cases.

It is well known that the chances of successful treatment of detached retinæ vary inversely with the length of time the condition has been present, so that the earlier the condition is recognized the better. In a careful history, one of the first symptoms will be the appearance of muscæ volitantes or spots before the eyes and this symptom is sufficient to warrant a careful examination of the fundus, because occasionally a small hole can be found before the separation of the retina has occurred. These spots are considered to be due to the rupture of a small blood vessel with extravasation of blood cells into the vitreous, and of course are not true physiological muscæ. Then, again, along with these spots before the eyes one often hears patients complain of visual aura or flashes of light, particularly in one field of vision. This is brought on by irritation to the sensory elements of the retina, which are stimulated by the wrinkling of the retina with beginning separation. Recognition of these symptoms will often be of great help in determining the area of the retina in which one should search most diligently for a hole.

Often the presence of hæmorrhage into the vitreous might be of sufficient density to mask an early detachment of the retina, so that one should keep this in mind whenever confronted

* Read at the Annual Meeting of the Canadian Medical Association, Section of Ophthalmology and Otolaryngology, June 21, 1950, Halifax, Nova Scotia.

with an idiopathic vitreous hæmorrhage. Then, too, this first hæmorrhage into the vitreous may lie sufficiently close to the retina to give the appearance of an early choroiditis and this faulty diagnosis has often militated against the early recognition of a detachment, preventing the prompt treatment of the more important condition.

Once a diagnosis has been made, one should make the first careful search for a hole or a tear. It is well to remember that tears are more frequently found in the upper temporal zone and slightly less frequently in the upper nasal area. Disinsertions or anterior dialyses are much more often found in the lower temporal region. Whether or not a hole has been found, the patient should be put to bed at once and the head immobilized with sand bags. We have found that a small pillow of sponge rubber is much more comfortable than the bare mattress and helps immeasurably in keeping the head still. The two eyes should be bandaged and patched, along with a black mask. It is not sufficient to use the black mask alone, as movement of the eyes is bound to occur when chinks of light strike the lids. With the head held in this manner the body may be moved freely in bed, in fact may be twisted and turned without any fear of disturbing the retina. It is surprising how comfortable a patient can be if he is allowed this freedom of movement of his body and he is not so likely to complain of backache which is so trying when the body itself is kept still. Atropine must be instilled into the eye to keep the ciliary body at rest. In this way traction on the retina is prevented when the pars plana of the ciliary body is contracted during accommodation. After four or five days the eye is examined again and in a large proportion of cases it will be found that the amount of detachment is considerably reduced. Folds in the retina will have been ironed out, and often one will find a small hole which was missed when the fundus was first examined. This rapid absorption of sub-retinal fluid enables one to give a very fair prognosis as to the possible result after the hole has been closed surgically. It shows also if there has been considerable absorption of the sub-retinal fluid, that drainage by means of a trephine opening is rarely necessary. Immobilization of the eye is essential to facilitate complete absorption of the sub-retinal fluid without recourse to any other method of drainage.

Once we have noted a tendency for the retina to return to its normal position, and, most important of all, a hole has been observed, the next step in the procedure is the localization of this hole on the sclera. This can be done easily by using a small Schweigger hand perimeter, and with the ophthalmoscope, one can measure the arc and meridian of the hole on the perimeter. Then by making use of Stine's[5] tables, one can easily estimate the distance in millimetres back from the limbus to the point on the sclera corresponding to the retinal hole when the retina is in place. With this information, *i.e.*, the discovery of a hole and the observed tendency of the sub-retinal fluid to be absorbed, we are now in a position to envisage a surgical repair with reasonable chance for success. To emphasize these points again, when we have found a hole, have localized it on the sclera, and have seen that with immobilization of the eye for a matter of days with both eyes covered, there is a tendency for the detachment to become less bullous, then, and only then, should we be confident of a successful result.

From now on the surgical treatment is relatively simple. One important point to remember is that we are going to attempt to close this hole and we are going to do it objectively. An effort is to be made to seal this hole off and we should be able to see before the patient leaves the table that this has been accomplished. In the past this was all too often done blindly and this haphazard method was responsible for all too many of our poor results. We must keep the pupil maximally dilated. Probably this is best done by a drop of 10% neosynephrine. I must emphasize that cocaine solution has no place in the surgical treatment of detached retinæ. This is because of its deleterious effect on the epithelium of the cornea and because it interferes with the surgeon's observation of changes taking place in the retina during the operation. Everything must be done to keep the optical properties of the cornea as nearly perfect as possible, as this is now an objective approach. Pontocaine solution is a most satisfactory topical anæsthetic along with a retro-bulbar and sub-conjunctival injection of procaine. The cornea must be kept moistened continuously with normal saline. The point on the sclera determined by Stine's tables in the vicinity of the hole is marked,

and one partial penetrating application of from 30 to 50 milliamperes of diathermy current is passed through the sclera causing a brownish burn of epi-scleral tissue. With the ophthalmoscope one will see a greyish anæmic spot in the retina opposite this diathermy puncture. If this cannot be seen with the ophthalmoscope a Walker pin is inserted which is readily visualized. One can therefore check objectively the site of further surface applications to make sure that the hole is completely encompassed. First the hole on the sclera is encircled with a double ring of partial penetrating punctures, the electrodes being three-quarters of a millimetre in length. Then about half a dozen penetrating punctures, that is with electrodes a millimetre and a half long, are placed in the centre of this area of diathermy barrage. One will expect to see a little sub-retinal fluid ooze out through these minute puncture wounds, and this is all the drainage necessary. The conjunctiva is closed and the patient is then returned to bed, with the head turned in such a direction that the most dependent part of the detachment is placed downwards. Again the head is completely immobilized but the patient is allowed free and full movement of the legs and the body. This is a great boon to older patients and one has not the same fear of a hypostatic pneumonia developing. Both eyes are bandaged for two weeks and on the third the patient is allowed up slowly using stenopæc goggles. Approximately three months after the diagnosis has been made and treatment instituted the patient should be able to return to work.

This, then, is the surgical approach by visual control to an idiopathic detachment of the retina in which a hole has been found and in which the amount of detachment has decreased during preoperative immobilization of the head. Unfortunately, there are cases in which it seems impossible to find a hole and where there is an extensive bullous detachment which does not retrogress after binocular bandaging probably associated with high myopia. Authorities today are realizing that a more heroic approach is here indicated; namely, scleral resection. This procedure is more difficult and hazardous but the results seem to more than warrant the extra care necessary. A proper evaluation must necessarily await the passage of time.

SUMMARY

1. The value of preoperative immobilization of the head with binocular bandages to allow absorption of the sub-retinal fluid and to improve the chances of finding and localizing retinal holes is stressed.

2. The use of the Schweigger perimeter and Stine's tables in localizing retinal holes on the sclera is shown.

3. A barrage of partial penetrating and penetrating diathermy current completely surrounding the hole will suffice, with no further drainage, when the sub-retinal fluid absorbs fairly quickly.

4. Postoperative immobilization of the head with freedom of movement of the body will allow the retina to become adherent to the choroid.

5. Frequent observation of the effect of diathermy current on the retina with the ophthalmoscope is of the utmost importance.

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INTERNATIONAL CONGRESS OF PHYSICAL MEDICINE (1952).—Organized by the British Board of Management of the International Federation of Physical Medicine. President, Lord Horder; Vice-Presidents, Dr. Frank Howitt (Treasurer), Dr. Philippe Bauwens (Chairman of the Executive Committee), Dr. Frank S. Cooksey; Hon. Secretary, Dr. A. C. Boyle, address, 45 Lincoln's Inn Fields, London, W.C.2.

The Congress will be held in London from July 14 to 19, 1952.

In accordance with the regulations of the International Federation of Physical Medicine, the meetings of the Congress will be reserved for matters dealing with the clinical, remedial, prophylactic and educational aspects of Physical Medicine and with the diagnostic and therapeutic methods employed in Physical Medicine and Rehabilitation.

Technical, scientific and historical Exhibitions also will be arranged.

In addition to the Scientific Programme, a full programme of social events and entertainment is being planned for the members and associate members. Arrangements for London and provincial visits of scientific and historical interest are also being made for the Congress week and the following week.

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AGE AND SEX DIFFERENCES IN THE SERUM CHOLESTEROL OF THE ALEUT*

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WITH the present interest in cholesterol and its possible relationship to atherosclerosis and coronary artery disease, many workers have been concerned with those factors influencing the serum cholesterol level. Among the factors considered for study have been age, sex, race and diet.[7] Previous investigations have attempted to inquire into the relationship between each one of these factors and serum cholesterol.

Since inquiry into these factors is normally hampered by the difficulty of obtaining groups of healthy individuals homogeneous except for the desired variable, it is often more practical to remove the investigation from the hospital and the city and carry it to areas where race, occupation and diet are constant, as is true in certain areas outside the continental United States.

This communication concerns the total serum cholesterol and the ester ratio among Alaskan Aleut studied during the 1948 Peabody-Harvard Aleutian expedition.¶

RACE, OCCUPATION AND DIET

The Aleut reported in this study were natives of Umnak, Atka and Attu Islands in the Aleutians. At the time of the study they were a genetically homogeneous group, largely Eskimo, with about 20% Russian admixture prior to 1870, according to Laughlin.[4] The principal activities were subsistence activities, and all of the adult individuals studied participated in fishing, hunting and gathering. There were no financial or occupational classes.

The Aleut diet is based on fish; the principal year-round staple being salmon, fresh, dried or smoked. Eggs, milk and butter are largely missing from the diet, as are leafy vegetables, except for one summer month. Dietary studies conducted by Mrs. Tomi K. Hibbett, M.A.,* showed the Aleut diet to be above National Research Council recommendations in protein and fat (principally seal oil), calcium and vitamin D, but low in carbohydrates, vitamin C and total calories. Thus, the Aleut diet at the time of the investigation was low in cholesterol but high in neutral fats and amino acids, some of which may be precursors of cholesterol. It was a low-calorie high-protein diet. The health conditions of the Aleut studied have been reported previously by Alexander.[1]

AGE AND CHOLESTEROL

In order to check the age differences in total serum cholesterol in this homogeneous group, the material was divided into two age groups. The first group included young Aleut up to 19 years of age, and the second included all remaining Aleut up to 70 years of age. There were 36 in the first group and 45 in the second group.

As shown in Table I, the younger Aleut had a significantly lower mean cholesterol. While this indicated an age change, it was not clear

TABLE I.
TOTAL CHOLESTEROL*—YOUNGER AND OLDER ALEUT

Age group and mean age		*No.*	*Mean ± standard error*	*Standard deviation*
0–19	10.28	36	169.6 ± 7.4 mgm. %	44.3
20–70	39.4	45	202.4 ± 7.8 mgm. %†	52.6

*Bloor Method.

†The adult mean for total serum cholesterol compares well with means recently given for Point Barrow Eskimo by Wilber and Levine [10] and is not markedly different from means for many American groups.

* From the Coronary Research Project, Massachusetts General Hospital and Harvard Medical School. Drs. P. D. White, H. B. Sprague, E. F. Bland, J. Lerman, S. A. Levine, and E. A. Hooton, Directors. Supported by a grant from the Commonwealth Fund, New York City.

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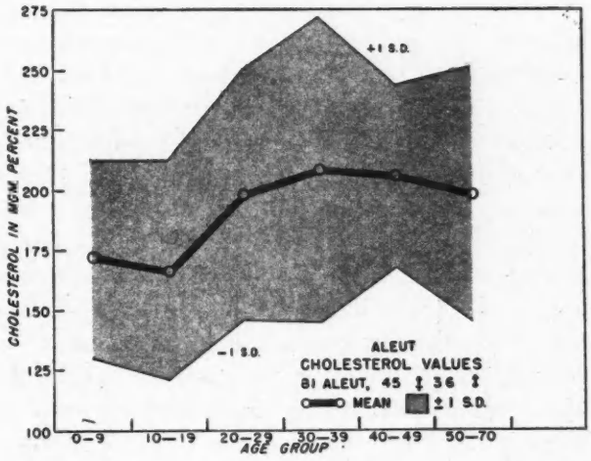
* Based on questionnaires collected by Dr. C. F. A. Moorrees, of the Forsyth Dental Infirmary, Boston Massachusetts, at Atka and Umnak Islands in the Aleutians.

TABLE II.
TOTAL CHOLESTEROL BY AGE GROUPS, 81 ALEUT

Age group	*No.*	*Mean age*	*Mean total cholesterol*	*Standard error*	*Standard deviation*
0 – 9.9	16	5.7	172.5	± 10.2	41.0
10–19.9	20	14.0	167.4	± 10.4	46.7
20–29.9	15	24.8	198.7	± 13.5	52.3
30–39.9	9	35.3	209.2	± 21.4	64.2
40–49.9	10	43.8	206.2	± 11.9	37.7
50–70.0	11	58.4	198.2	± 16.1	53.6



whether there was a continuous rise with age or a sudden rise during one decade. Accordingly, the data was rearranged by decades, and the means for each decade were computed as shown in Table II and Fig. 1.

As shown in Table II, the first two decades are substantially similar in total cholesterol, both approximating 170 mgm. %. The means for the later decades, on the other hand, are all about 40 mgm. % higher. Thus, there is marked and probably significant change ($p=0.05$) in total serum cholesterol between the second and third decades among the Aleut; and the rise is largely confined to the third decade, since there is no evidence of cholesterol elevation in the second decade. Thus, it appears that adult levels are attained subequent to the termination of the growth period.

SEX AND SERUM CHOLESTEROL IN THE ALEUT

Since there is disproportionate sex ratio in coronary atherosclerosis, it is of interest to determine whether there is a similar sex difference in the total serum cholesterol. Accordingly, the 81 determinations were averaged for males and females, separately, as shown in Table III.

It was noted that, for Aleut males and females of comparable age, there was neither any significant sex difference in the total serum cholesterol nor any significant difference in variance. This was checked separately by computing separately the means for adult Aleut alone. The means for 28 women and 17 men over 20 were 206 mgm. % and 199 mgm. %, respectively. Thus, it appears that among the Aleut there is no significant sex difference in total serum cholesterol at any age.

CHOLESTEROL ESTERS AND THE CHOLESTEROL ESTER RATIO IN THE ALEUT

Sperry and others have suggested that the amount of esterified cholesterol and the ratio of esterified to total cholesterol may be of as great importance as the level of total cholesterol alone.[3, 9] Moreover, it has been suggested that the ratio of esterified cholesterol to total cholesterol may increase with increased intake of neutral fat.[2] Accordingly, the ester-cholesterol ratio was computed for 36 cases, all from Umnak Island. The mean ratio was 57.6 ± 5.5 as compared to a mean of 55.6 ± 0.77 established for 146 male Americans.[6] Thus, the fat-eating Aleut showed no significant difference in the cholesterol ester/total cholesterol ratio. The data were also studied intensively to see if there were any sex or age differences. Aleut males showed a mean ratio of 56.9 ± 3.2,

TABLE III.
TOTAL SERUM CHOLESTEROL, ALEUT MALES AND FEMALES

Sex	*No.*	*Mean age*	*Serum cholesterol ± standard error*	*Standard deviation*
Females	45	27.26	190.4 ± 7.7	51.5
Males	36	25.39	184.6 ± 8.6	51.8

and the mean ratio for females was 57.8 ± 3.5. The difference (0.9) was not significant. Similarly, the Aleut under 20 and the Aleut over 20 showed no significant difference in the ester ratio, the means being 55.6 ± 4.5 and 59.3 ± 4.5 %, respectively. Accordingly, it appears that within this group neither sex nor age affects the cholesterol ester/total cholesterol ratio, and the ratio is substantially identical in normal Americans and in Aleut, although the latter lack milk, butter, eggs and cheese in their diets.

HYPERCHOLESTEROLÆMIA

Hypercholesterolæmia, as defined by a total serum cholesterol value in excess of 300 mgm. %,[3] was noted in 4 Aleut, 2 men and 2 women. An alternative definition of hypercholesterolæmia as a total serum cholesterol level in excess of the adult mean plus two standard deviations yields an identical number. The proportion of Aleut with hypercholesterolæmia (5%) does not differ significantly from expectancy in terms of the normal distribution curve. Hence, it cannot be said that the Aleut diet or the Aleut mode of living either promotes hypercholesterolæmia or restricts it.

DISCUSSION

The present study shows that the serum cholesterol of the Aleut, on a low-cholesterol, low-calorie, high-protein and high-fat diet, is of the same order as would be expected for comparable Americans on the usual diet, with butter, eggs, cheese and milk and calories in abundance. This, together with the presence of individual cases of hypercholesterolæmia among the Aleut on the native diet, tends to indicate that reduction in the exogenous sources of cholesterol, or even low calorie diets, do not alter the basic serum cholesterol pattern.

The data show a marked difference between children and adults in total serum cholesterol, and they suggest that a relatively rapid rise subsequent to cessation of growth is responsible for this difference.

The lack of a sex difference in total cholesterol among the Aleut tends to confirm the present indications that factors other than the amount of cholesterol must be considered in the etiology of atherosclerosis: on the basis of serum cholesterol alone, atherosclerosis should be equally common in both sexes.[11]

The data also suggest that the cholesterol ester/total cholesterol ratio is constant despite differences in the diet, and that sex and age differences in the ratio may be minor. Hence, despite the marked difference in diet, the cholesterol level and the cholesterol ester/total cholesterol ratio in the Aleut closely approximate healthy Americans similarly studied.

SUMMARY

Serum cholesterol determinations were made on the blood of 81 native Aleut in order to investigate the serum cholesterol in this homogeneous group, differing from continental Americans in race, culture, and in the possession of a low calorie, high-protein and low cholesterol diet. The mean adult serum cholesterol did not differ significantly from Point Barrow Eskimos or adult Americans. No significant sex difference in total serum cholesterol was noted; an age difference was noted with the suggestion of a marked rise subsequent to the cessation of growth. The cholesterol ester/total cholesterol ratio, in 36 Aleut, closely approximated the ratio in Americans—no sex or age differences in the ratio was noted. Despite the common diet, 4 cases of hypercholesterolæmia were encountered. The evidence suggested that endogenous mechanisms are responsible for the maintenance of the serum cholesterol.

The authors acknowledge the statistical assistance of Mrs. Jennifer Lehmann and the aid of Dr. H. B. Marjerison, Associate Director of the Forsyth Dental Infirmary for children, during the expedition.

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Science in medicine is a process of mind, a cultivated reasoned and critical approach to the problems of disease, and is not to be found in an impressive array of laboratory equipment or facility in the mastery of an intricate technique.—Reginald Webster, *M. J. Australia*, **37**: 858, 1950.

CASE REPORTS

RUPTURE OF AN ILIAC ANEURYSM

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Tortuosity and dilatation of the iliac arteries are common in people over 70 years of age but it is rare for them to rupture. This case is recorded because a saccular aneurysm of the right common and internal iliac arteries ruptured. There was aneurysmal dilatation of the same segments of the left iliac arteries.

An 80 year old man was awakened by severe steady lower abdominal pain that was worse on the right side and gradually increased in intensity. During the 5 hour interval between the onset of pain and admission to hospital he vomited several times and fainted twice. His temperature was 99°, blood pressure 125/80, pulse rate 86/min., rising to 100 shortly after admission. Examination of the obese muscular abdomen revealed some voluntary guarding and deep tenderness in the right lower quadrant. There was a small easily reducible right direct inguinal hernia. No masses could be felt, there was no distension, rigidity or rebound tenderness, and normal bowel sounds were audible. Rectally, a non-tender smooth boggy immovable mass estimated to be 2 inches in diameter was palpable at the tip of the examining finger. It obliterated the lumen of the rectum and was thought to be extra-mural. On one occasion it was felt to be pulsatile. The Hb was 64%, white blood cells 20,000, urinalysis and Wassermann reaction were negative, and the non-protein nitrogen was 43%.

Laparotomy was performed 7 hours after admission to hospital and revealed a large pulsatile retro-peritoneal pelvic hæmatoma. A diagnosis of ruptured atherosclerotic aneurysm of the lower aorta was made and no further surgical intervention was undertaken. His post-operative course was progressively downhill. The retroperitoneal hæmatoma was thought to have increased in size because the pulsating rectal mass later extended down to within about 1½" of the anal orifice. He developed marked distension of small and large bowel and died 4 days after operation.

AUTOPSY FINDINGS

At autopsy there were aneurysms of the common and internal iliac arteries on each side (Fig. 1). The largest aneurysm involved the lower part of the right common and the upper part of the right internal iliac artery. It was saccular, measured 11 x 10 x 9 cm. and lay close to the midline. There was a Z-shaped tear of its anterior surface, and the artery wall at the sites of rupture was very thin. About 2,000 c.c. of blood most of which was clotted, was spread freely in the retroperitoneal space and especially in the pelvis surrounding the ruptured aneurysm, in the para-colic gutters, perirenal tissue and in the mesentery of the small bowel. In some regions blood extended to the mesenteric border of the small bowel and up to 1 cm. around each side of it. There was marked small bowel distension. The ascending colon was moderately distended to the hepatic flexure and beyond this the large bowel was collapsed up to the proximal portion of the sigmoid. The sigmoid colon and its redundant portion was greatly distended.

Covering the ruptured anterior wall of the aneurysm was an adherent membrane wall consisting of loose connective tissue and the posterior peritoneum. The right ureter was compressed between this membrane and the aneurysm with resultant moderate hydroureter and slight hydronephrosis. There was a moderate amount of blood in the right spermatic cord. This blood had probably spread from the retro-

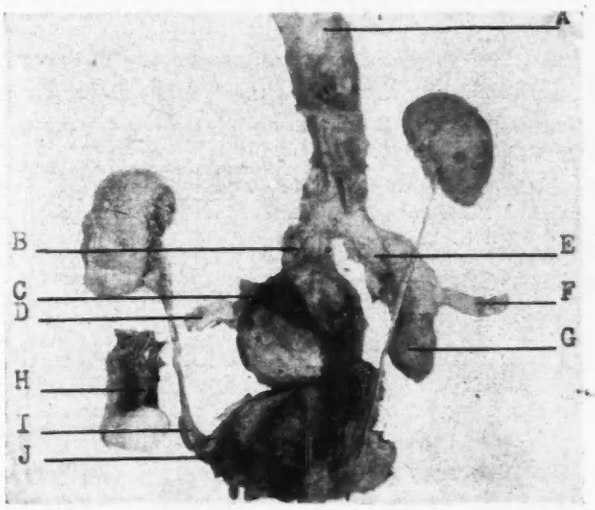

Fig. 1.—(A) Aorta. (B) Right common iliac artery. (C) Torn anterior wall of aneurysm. (D) Right external iliac artery. (E) Left common iliac artery. (F) Left external iliac artery. (G) Left internal iliac artery. (H) Right spermatic cord. (I) Right ureter. (J) False anterior wall of aneurysm reflected downwards.

peritoneal space, but it may have possibly resulted from obstruction and hæmorrhage of spermatic veins caught in the false anterior wall of the aneurysm, although this was not demonstrated. The distal end of the large saccular aneurysm was 4 cm. below the origin of the right internal iliac artery. At this point a constriction narrowed the wall of the vessel to 4 cm. in diameter and below this the internal iliac artery was evenly dilated to 7 cm. in diameter. It was intact and was covered anteriorly by the bladder.

Five cm. below its origin the left common iliac artery became dilated and measured 4 cm. in diameter. This aneurysmal dilatation involved the upper 2 cm. of the left internal iliac

artery which then narrowed suddenly to 2.5 cm. in diameter. It is interesting that the site of this dilatation and constriction corresponded exactly to that of the large saccular aneurysm on the right side. Distal to its constriction the left internal iliac artery was also evenly dilated to 4.5 cm. in diameter throughout.

The right common and both internal aneurysms were almost completely filled with adherent laminated thrombus but a probe could be passed through the common into the external iliac arteries. The aorta, especially in its abdominal portion, and all iliac vessels were moderately atheromatous, with the intimal surface raised by many longitudinal yellow streaks and pearly plaques. Ulceration and calcification were absent. Normal inferior gluteal and internal pudendal arteries arose from the internal iliac aneurysms. The right common and internal iliac veins were compressed by the large saccular aneurysm on the right side and the intimal layers of the internal iliac vein were adherent.

The heart weighed 390 gm. and the slight enlargement was due to hypertrophy of the left ventricle. There were no valvular deformities. The coronary arteries were moderately thickened by scattered yellow raised atheromatous plaques but were patent throughout. The remaining gross autopsy findings were irrelevant.

Microscopic study of the aneurysm walls revealed moderate atheroma. The most striking feature however was senile atrophy, mucoid degeneration and hyalinization of the media with irregular thinning.

SUMMARY

A case is reported of rupture of a saccular aneurysm of the right common and internal iliac arteries. The same arteries on the left side showed aneurysmal dilatation. The retroperitoneal hæmatoma was palpable by rectum.

A CASE OF DERMATOMYOSITIS

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Of all types of myositis described in the literature and met with in practice (ossificans, traumatic, rheumatic, syphilitic, etc.) dermatomyositis is marked for its rarity and gravity of its effects. The etiology of this disease is obscure although it is generally considered to be a trophoneurotic disturbance. Most persons affected are of the younger age group but references to it in the pædiatric literature are few, possibly due to scanty therapeutic means and the poor prognosis in most cases.

Dermatomyositis is an acute or subacute inflammation causing fibrosis and board-like rigidity of the voluntary muscles resulting in complete loss of their contractile function and ankylosis of regional joints. The skin becomes involved secondarily with the onset of the scleroderma stage. Death finally supervenes when the muscles of respiration and deglutition become involved in the process or through some intercurrent infection.

This report deals with the case of a girl aged 15 with a history of psychoneurosis in her father and of hysteria in her mother. Her chief complaints were general weakness and stiffness in her back and limbs. Physical examination revealed a poorly nourished adolescent female 61 inches high and weighing 85½ lb. There was limitation of extension at the elbow joints, stiffness and limitation of movement in all directions at the hip and shoulder joints. Her heart was normal. Blood pressure 126/84. The deep tendon reflexes were normal in the lower extremities and not obtainable in the upper. The feel of the muscles and that of the skin of the eyelids and knuckles suggested dermatomyositis. The following extract from her case history at the Mayo Clinic will give the salient laboratory findings:

Urinalysis was negative. Hæmoglobin 12.2 gr. Erythrocyte count 4.4 million. Leucocyte count 5,000. Sedimentation rate 17 mm. at the end of 1 hour. Blood serology and tuberculin tests were negative. Serum calcium 9.7 mgm. %. Serum phosphatase 4.4 mgm. %. Bodansky alkaline phosphatase 3.2 units. Urinary excretion of creatinine 587 mgm. %, that of creatine 495 mgm. %, in 24 hours. Basal metabolic rate plus 16. X-rays of chest, spine and joints were all negative.

Needle electrodes inserted into the left triceps and right hamstring muscles showed no definite fibrillation potentials. With voluntary contraction many low amplitude polyphasic motor unit potentials were observed. These were of short duration.

Generally, only symptomatic treatment is advised as no permanent cure can be expected. I used the Mayo treatment, based more on empiric than scientific grounds. It consisted of 75 mgm. vitamin E per day by mouth and 25 mgm. testosterone propionate twice a week by intramuscular injection. Appropriate exercises and thermal treatment were also prescribed. Under these treatments the patient's progress was favourable during the past 12 months. She gained in weight, her gait improved and there was some increase in range of movement at the shoulders. Less affected by treatment were the elbow joints and lumbodorsal muscles. Had these been started earlier the ankylosis and muscle stiffness might perhaps have been prevented.

After discontinuance of treatment for one year I noticed more improvement; so that the hormone therapy is the most encouraging one.

SUMMARY

1. Dermatomyositis is a disease of unknown etiology characterized by neurotrophic lesions in voluntary muscles.

2. Treatments with high doses of male hormone, heat and exercises can bring on remissions for considerable period, though no permanent cure can be expected.

3. Muscles of the lower limbs are more benefited by treatment than those of the upper limbs and spine.

4. Treatment should be started before the stage of joint ankylosis and scleroderma has set in.

PEMPHIGUS VEGETANS TREATED BY FULGURATION

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There is an old adage that if you cure a case of pemphigus vegetans, you had better review your diagnosis. The diagnosis in the following case was made by a qualified skin specialist, and to anyone who might still doubt, I would say: "You name it". The fact remains that the condition as described was completely cleared up by the treatment to be described, with no recurrence in over four years. This case history is submitted in the hope that it may prove useful to others.

Mrs. L.G., age 74, widow. I was called to her home September 14, 1945. She had herpetiform eruption in both axillæ, both groins, both labiæ majora, (but not mucous membrane of the vulva) and scattered spots on back and abdomen. Confined to bed and caloxol lotion applied. Blood Kahn proved negative.

Admitted to Vancouver General Hospital September 28. At that time the individual lesions looked like typical herpes zoster. In fact, the intern in phoning me that my patient had arrived, referred to it as: "Your case of herpes zoster". But, the distribution was all wrong. However, as 10 c.c. blood taken from antecubital vein and injected into the hip is a treatment sometimes found beneficial in herpes zoster, on the off-chance that it might do some good and could do no harm, this was done on three successive days, with no improvement.

On October 3, Dr. Donald H. Williams, skin specialist, was called in consultation. His diagnosis was pemphigus vegetans. He advised as to treatment and kept in touch with the case throughout its course.

Quoting from his notes made at the time: "Acute pemphigus. Partially generalized dermatosis involving axillæ, genito-femoral region and trunk. One ulcero-membranous lesion buccal cavity, and a small conjunctival lesion left eye. Lesions: blebs, superficial ulcers with pyogenic border, and tendency to vegetate in axilla and groin. Should rule out sensitivity to phenolphthalein. Has been taking occasional laxative pill."

The case was seen by many other doctors, who, like myself, had never seen one like it before. One, who had spent considerable time in the tropics, suggested yaws, but a negative Kahn ruled that out. It is regretted that no photographs were taken, but the following description of the lesions when fully developed, may suffice: If you were to slice the top off a cauliflower one-quarter to one-third of an inch thick and paste that plaque in the axilla, etc., then dye it a slightly pinkish dirty muddy grey colour; add to that the nauseating odour of bromidrosis, and you would have a fairly accurate picture. Temperature was never a feature, ranging between 97 and 99, occasionally 100, once 101.

Treatment; for the odour, potassium permanganate baths, and in the interval 5% gentian violet. Although the Kahn was negative, tryparsamide was tried. She was also given a course of penicillin, followed by a course of sulfadiazine. Argyrol for the eye. As the small lesion on the buccal membrane did not appear to develop, it was not treated. As nearly as we could judge, no treatment thus far had any effect in arresting the course of the disease. She was low and depressed and gradually going down hill.

As we were getting nowhere, I suggested that we try fulgurating the lesions on the chance that it might do some good. It was agreed that it be tried out first on small patches. Treatments were begun October 24, and repeated at from one to a few days' intervals till November 9. Patches about size of fifty-cent piece were fulgurated, using novocaine and adrenalin anæsthesia. Although a liberal amount of novocaine was used, the patient complained of much pain, and for several hours afterwards. However, the effect on the lesions was so encouraging that it was decided to do one whole axilla under general anæsthetic.

First treatment November 16. Having in mind the pain after doing a small patch, it was not cauterized down to the base. But she did not complain of pain after coming out of anæsthetic. November 24, left axilla done, also some small patches on body. November 29, right axilla again fulgurated. By this time the improvement was so marked that we knew we were on the right track. Treatments were done at intervals of about one week or so, 9 treatments in all, until all lesions were clear. Last treatment February 16, 1946. When the bases of the lesions were being cleaned up, there was a certain amount of weeping from them, and she complained of smarting, but nothing out of the way. With all lesions healed, she was discharged from hospital.

In doing the treatments, not knowing what reaction to expect, it was thought best to "go slow" but as no adverse reaction followed, if doing it over again, I would make a clean sweep of one axilla, if not both, right down to the base at the very first treatment, and at least that much again at subsequent treatments until all lesions were clear.

On March 13, 1946 she called at my office. She had a few small patches on the scalp, which I fulgurated under local anæsthetic. It was several weeks before she called again. She had gained weight, looked well, felt well, and had had no recurrence. It is now over four years since then with no recurrence of the pemphigus whatever.

While it may be considered irrevelant, it is only fair to state that in 1939 she was treated by radium at the Cancer Institute, Vancouver, for carcinoma of the cervix. She is now under the care of Dr. W. C. Walsh for cancer of the bladder. He informs me that there is practically no scarring and no skin contraction in the fulgurated areas.

SPECIAL ARTICLE

PROFESSIONAL AND PUBLIC EDUCATION ON CANCER*

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Through a lay education program the public is being aroused to the importance of the early diagnosis and treatment of cancer. Furthermore, the hopeful aspects of this disease, when adequately treated, are being emphasized. To increase the number of patients successfully treated for cancer, the Canadian Cancer Society and its affiliated provincial organizations are carrying on this important part of our efforts with funds donated by the public.

The Canadian Cancer Society is, in addition, making substantial donations to support the work of the National Cancer Institute of Canada. These funds, together with monies derived from governmental sources, are used to encourage and support fundamental research in our Canadian universities and treatment centres. In conjunction with the Canadian Medical Association and the medical faculties of our universities, the National Cancer Institute is also contributing to activities which are designed to bring up-to-date information on cancer to the doctors of Canada.

The National Cancer Institute has arranged to distribute to every doctor in Canada authoritative monographs on the early diagnosis of cancer written by outstanding clinicians, surgeons and teachers. The National Cancer Institute and the medical profession of Canada are indebted to the American Cancer Society and their medical colleagues in the United States for permission to reprint and distribute their well illustrated and instructive monographs. Two of these monographs, Cancer of the Head and Neck and Cancer of the Lung have been distributed to every doctor in Canada. A third, The Diagnosis of Genito-Urinary Neoplasms, has been sent to over 3,000 doctors who returned the card enclosed with the first monograph.

These monographs are both instructive and helpful and will serve as valuable reference material for both the practitioner and specialist.

A fourth monograph on Carcinoma of the Breast by C. D. Haagensen of the Institute of Cancer Research of Columbia University and the Presbyterian Medical Centre of New York is now in the process of distribution.

In the opening paragraphs of this excellent treatise, which re-emphasizes the importance and value of early diagnosis and treatment of cancer of the breast, Dr. Haagensen advocates regular self-examination of the breast by the patient. To quote directly from the monograph:

> "Our propaganda to the public has emphasized the possible grave significance of a breast tumour and has urged women who discover a breast tumour to consult a physician at once, but we have done nothing to educate women in how to examine their own breasts and how to find tumours in them. A correct technique for self-examination greatly increases a woman's chance of detecting a tumour in her own breast, just as it increases the physician's chance of finding it during his examination. It is probable that, from the point of view of the greatest possible gain in early diagnosis, teaching women how to examine their own breasts is more important than teaching the technique of breast examination to physicians, for we must keep in mind the fact that at least 98% of the women who develop breast carcinoma discover their tumours themselves.
>
> This discovery is usually an accidental one, often made in the course of casual palpation of the breast while bathing. If, instead, women were taught to examine their breasts systematically and with the correct technique, we might expect a great improvement in early diagnosis."

I concur in this advice with the reservation that the physician should accept the responsibility to demonstrate the technique of self-examination described in the article by Dr. Haagensen to a selected group of women who by temperament, general knowledge and attitude are likely to benefit from this advice. At this moment, at least, I question the wisdom of using a movie film to show this procedure to large groups of women.

The section dealing with the early clinical signs of carcinoma of the breast is a masterpiece. The author guides the medical practitioner through each successive step in arriving at a presumptive diagnosis of malignancy leading to immediate biopsy. To quote directly from the author's description on incisional biopsy:

> "The diagnostic problem is discussed fully with the patient, as gently and as hopefully as possible. Her consent for radical mastectomy, should it be required, is obtained. She is admitted to the hospital and all preparations made for the radical operation. The surgical pathologist often sees and examines the patient before operation. He is regularly present in the operating room when the biopsy is done. Intravenous pentothal sodium supplemented with nitrous oxide and oxygen is our anæsthetic of choice. (We do not use local anæsthesia; it puts the patient on the rack of suspense while the diagnosis is being made).
>
> A small incision, 3 or 4 cm. in length, is made through the skin over the tumour and deepened to expose its surface. All vessels are meticulously caught with mosquito clamps and tied with fine silk, so that the wound is perfectly dry and the surgeon is able to see the cut surface of the lesion as he incises it. If the tumour is solid, a small wedge, measuring about 3 x 5 mm., is excised. This is ordinarily adequate for our frozen section. On infrequent occasions when the microscopic diagnosis is difficult, the pathologist may ask for a second small wedge of tissue. We do not excise the whole tumour for diagnosis unless it is a very small one, measuring only a few millimetres in diameter, for we believe that the practice adds unnecessarily to the risk of producing metastasis."

In the section on treatment Dr. Haagensen has expressed very clearly his opinion on the criteria for operability, operative procedures and the place of radiation therapy in the treatment of this disease. The indications and dosage for hormonal therapy in inoperable carcinoma of the breast are presented.

* A contribution by the National Cancer Institute of Canada and the Canadian Cancer Society.

A number of our Canadian centres will be in general agreement with Dr. Haagensen's point of view. There are other centres which will not be in complete agreement. For instance, there will be some who regard Dr. Haagensen's criteria of operability as too strict, who feel that not only survival statistics but also the comfort of the patient should receive consideration in arriving at a decision as to the best form of treatment for the disease in its various stages. The treatment policy, for example, of one of our largest centres in Canada takes into consideration this very important point of view and the published results of that clinic[1] demonstrate that good radiation therapy in conjunction with surgery has a definite place in the treatment of cancer of the breast.

Using a slight modification of Portmann's classification, this group recommends radical mastectomy with or without postoperative radiation in Stage I, radical mastectomy with postoperative radiation in Stage II, preoperative radiation followed usually by radical mastectomy in Stages III and IV and radiation only in Stage V. They point out, however, that radiation either preoperatively or postoperatively does not justify anything less than the most meticulous radical operation.

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2. JANES, R. M.: *Canad. M. A. J.*, 62: 14, 1950.

HOSPITAL REPORTS

ROYAL VICTORIA HOSPITAL COMBINED STAFF ROUNDS

No. 2

Thrombo-embolic Phenomena

I. Gynæcological Aspects, Dr. Thomas Primrose
II. Medical Aspects, Dr. Louis Lowenstein
III. Surgical Aspects, Dr. J. C. Luke
IV. Pathological Consideration, Dr. R. H. More

I. GYNÆCOLOGICAL ASPECTS

The case to be presented today is from the Department of Obstetrics and Gynæcology. The patient had her uterus removed and some twelve days later developed what was diagnosed as a thrombosis in the deep venous circulation of the left calf which went on within twelve hours to give a small pulmonary embolus in the right lung. She was treated and is now recovering well.

The patient is 41, married, with two children, full-term, one in 1931 and the second in 1934. In 1940 she had an anterior and posterior repair with amputation of the cervix. In May, 1949, she was re-admitted with menorrhagia and a D.& C. was done which, however, did not control her bleeding. She was discharged on the sixteenth day postoperative and states that immediately thereafter the right leg became painful and swelled. She was in bed for one month but the leg has remained chronically swollen ever since. Due to continued bleeding she was re-admitted and a hysterectomy performed on October 23, 1949, through a mid-line lower abdominal incision. On the tenth day after operation the wound was healed and the deep sutures were removed. On the evening of the twelfth day she presented the first symptoms of pain in her left calf. Twelve hours later she had a small right pulmonary embolus with classical signs of deep venous thrombosis in the left leg. She was treated by 100 mgm. of heparin, q.6 h. for thirty-six hours with simultaneous dicoumarol therapy. The dicoumarol dosage was subsequently adjusted according to the prothrombin time. This therapy was discontinued on the seventh day after her embolus when her signs and symptoms had cleared completely.

In the Maternity Hospital our incidence of thrombo-embolic disease is not at all high, although it has apparently risen within recent years due to a heightened interest in the subject and a more ready diagnosis of the condition. We are looking for this complication, finding more early cases and recording them. The only accurate figures available are those of the fatal cases. These fatal cases occurring in the Maternity Hospital in 25 years have been analyzed and compared with those in three other large clinics. In 21 proved cases of thrombo-embolic deaths 74% were between 35 and 60 years of age. This follows the general trend. In the Maternity Hospital between 46,000 and 47,000 obstetrical deliveries took place in 25 years and our incidence per 10,000 was 1.48 and on the gynæcological side, five per 10,000 in 36,000 major operations.

The Lahey Clinic in one series of 56,000 had 9.6% in major surgical cases. In 1937 twelve London hospitals were canvassed and their overall picture in surgery and gynæcology combined was 10.4 per 10,000. Bauer, in Sweden, collected tremendous figures and their combined incidence was 3.3 per 10,000 in obstetrics and 26.0 per 10,000 in gynæcology.

The fatal cases in 24 years followed in the main the recognized so-called dangerous operations, major pelvic surgery. In 80% of the cases who died the surgery was of the very major category. The remaining 20% were from minor operations, D.& C.'s and two Oldschausen suspensions.

II. MEDICAL ASPECTS

The point should be emphasized that this patient suffered a postoperative thrombosis of the deep veins of the lower right leg after her D.& C. several months before the present admission. Hysterectomy is followed by thrombosis in some 4% of patients and by pulmonary embolism in approximately 0.7%. Fatal embolism

occurred postoperatively in 10% of the Mayo group of cases who had suffered previous thrombo-embolic disease. Prophylactic anti-coagulant therapy might have prevented the present episode. After the diagnosis of thrombosis was established, heparinization should not have been delayed until after embolism occurred.

After the moderate initial dose of 300 mgm. of dicoumarol this patient's prothrombin time rose to the dangerous level of 70 seconds (about 5% of normal prothrombic activity), although bleeding fortunately did not occur. About 15% of patients are hypersensitive to dicoumarol. A smaller group are relatively insensitive.

It was necessary to decide whether this patient should be treated with anticoagulants, ligation or ligation plus anticoagulants. The objectives of therapy in thrombo-embolic disease may be grouped as follows:

1. The prophylactic prevention of thrombosis.
2. If thrombosis, but not embolism, has occurred, the objective is to prevent extension of the thrombus, additional thrombosis elsewhere, embolism, and to minimize post-thrombotic sequelæ.
3. If thrombosis and embolism are already present, the prevention of further embolism or propagation of the thrombus at the site of the embolus.

Many Swedish and American authorities believe that anti-coagulant therapy alone is the method of choice. Thus, before anti-coagulant therapy was introduced, the reported mortality of bland thrombosis ranged from 6 to 18%. Anti-coagulant therapy has reduced this mortality to less than 0.5%. Anti-coagulant therapy has reduced the mortality of pulmonary embolism from above 18% to less than 1%. Bauer initiated anti-coagulant therapy in most of his cases before the thrombus extended above the knee and reported a minimum number of post-thrombotic sequelæ. This prevention of late sequelæ needs emphasis. His results illustrate the importance of early diagnosis and treatment. In the presence of multiple emboli, septic thrombophlebitis or if significant thrombosis or embolism develops while under adequate anti-coagulant therapy, bilateral vein ligation at the suitable level should be considered. Ligation alone does not always prevent extension of the thrombus above the site of ligation or the development of thrombosis elsewhere, such as in the opposite leg or pelvic veins.

At present there is no satisfactory practical method of predicting the development of thrombo-embolic disease in a given patient, other than a history of previous thrombosis and the expected incidence of thrombo-embolism in certain diseases and obstetrical and surgical procedures. Prophylactically, dicoumarol is cheap and may be given orally within 24 hours after delivery or operation.

Combined heparin and dicoumarol therapy should be initiated as early as possible in active thrombo-embolic disease. The effect of heparin is immediate; that of dicoumarol is delayed for 36 to 48 hours. The following working scheme is suggested. Pre-treatment clotting and prothrombin times are obtained. If the patient has no advanced liver, renal or primary hæmorrhagic disease, 50 mgm. of heparin are given intramuscularly and at the same time 200 to 300 mgm. of dicoumarol orally, depending upon the size and age of the patient and the nature of the illness. Three hours after the initial dose of heparin, a clotting time of the blood determines the heparin sensitivity of the patient. If it is less than twice the pre-heparin clotting time, 75 mgm. of heparin should be given every four hours; if two to three times the pre-heparin clotting time, 50 mgm. should be given every four hours; if greater than three times the pre-heparin clotting time, the dose should be less than 50 mgm. every four hours. While heparin is being administered, clotting times should be performed twice daily, 2½ to 3 hours after the heparin injections. Prothrombin times should be performed daily and should be determined immediately before and not shortly after the administration of heparin. As soon as the prothrombin time is significantly prolonged, heparin may be discontinued. Dicoumarol therapy should be continued for a minimum of the twelve days required for endothelization of the thrombus. Time does not permit the discussion of other methods of heparin administration, of depot heparin or of the newer dicoumarol-like anti-coagulants.

Dicoumarol therapy causes minor hæmorrhage in about 2% of all patients, and serious hæmorrhage in another 1 to 2%. Serious bleeding occurs less frequently after heparin. Heparin induced bleeding may be rapidly controlled by intravenous administration of protamine sulphate or toluidine blue. Dicoumarol-induced bleeding is more difficult to control. Substitution therapy with fresh blood transfusions supplies some prothrombin and a number of transfusions may be required to arrest bleeding. Massive vitamin K therapy (75 mgm. intravenously) may accelerate the restoration of a satisfactory prothrombin level. This usually requires 24 to 48 hours, during which time serious bleeding may continue.

The two-stage method of prothrombin determination is impractical for clinical purposes. All of the one-stage methods depend on the assumption that, in the presence of an excess of thromboplastic material, the clotting time theoretically varies inversely as the concentration of prothrombin in the plasma. It is now well established that this is not actually true, that other accelerators and inhibitors of clotting are present and constitute marked potential sources of error as regards the interpretation of the prothrombin time. The Quick one-stage method is as satisfactory as any.

III. SURGICAL ASPECTS

In discussing the rôle of surgery in the treatment of phlebitis, it must be emphasized that

phlebitis is primarily a medical disease but that the judicious use of surgery will shorten convalescence, and reduce the danger of embolism, also the incidence of the late sequelæ of the post-phlebitic leg.

The best example of the surgical treatment of phlebitis is in the case of thrombophlebitis involving the superficial veins in a person with long-standing varicosities. One frequently sees such an individual confined to bed for weeks and finds in six to twelve months later that the thrombosed varices have recanalized and the patient is again subject to the chronic stasis effects with its possible complications. How simple it is in this acute phlebitic episode to ligate the great saphenous vein at its junction with the femoral, apply a compression bandage to the inflamed varices and so permit continued ambulation. Nature has produced her own sclerosing solution and the varices will remain sclerosed and will disappear when the source of reverse flow from the upper saphenous vein has been removed. The occasional case where propagation of the saphenous clot into the femoral vein occurs with consequent deep phlebitis or pulmonary embolism will also have been avoided. The operation is a minor one and can be done under local anæsthetic as an out-patient. However, the ligation must be done under full operating room facilities and the saphenous vein tied flush with the femoral.

Surgery also has its place in the treatment of acute thrombophlebitis of the deep veins. This statement is somewhat controversial but it is our belief that ligation of the superficial femoral vein close to the bifurcation of the common femoral in the early case which has commenced in the lower leg will tremendously reduce late morbidity. I realize that most authorities recommend antibiotic and anticoagulant therapy in such instances but few have the opportunity to see the severe degree of late complications such as ulcers, eczema and the chronically swollen leg such as we do in the Vascular Clinic. If the acute thrombophlebitis can be prevented from progressing centrally and can be halted before the process reaches the common femoral vein then the post-phlebitic leg will not occur. The only certain way to prevent this upward extension is to divide the superficial femoral vein just distal to the profunda branch. Again, this operation is a simple one which can be done under local anæsthetic, but I would like to emphasize that only those cases which are diagnosed early and where all the signs and symptoms are confined to the lower leg are suitable. Once thigh signs and symptoms are present, the case is too late for surgery, as one will find, if operated upon, that the adherent clot is already in the common femoral vein. Anticoagulant therapy should also be combined in association with vein ligation to prevent extension of the process in the distal leg.

The third group of cases and that group into which our patient of today fits are those cases of "bland" or phlebothrombosis of the deep leg veins. As you know, one does not worry about late post-phlebitic leg changes in these cases because this does not occur because of the minimal associated inflammatory vein changes. One worries about the frequent incidence of pulmonary embolism. Anticoagulant therapy will not dissolve the clot which has already formed, and consequently, when on the medical therapy of anticoagulants, the patient is constantly sitting on a powder keg. How much more logical it is to divide the superficial femoral vein close to the profunda junction and so trap the potential embolus in the distal leg. Again, I must emphasize that signs and symptoms must be present in this leg to indicate the correct leg involved. If doubt exists that the process is unilateral, then both legs should be so treated. Frequently at operation one will find that the thrombus has already extended into the common femoral vein. In this instance careful suction introduced centrally will remove a loose bullet-ended piece of thrombus indicating total removal of the offending clot. At the present time it is our feeling that not every case with evidence of bland thrombosis in the lower leg should be operated upon. I am one of the "middle-of-the-road" group who feel that anticoagulant therapy should be initially employed because less than 20% of such cases do throw emboli. However, once embolization has occurred, especially when on treatment by anticoagulants, a second and possibly fatal one is a distinct possibility. In such an instance, vein exploration and ligation is indicated as a semi-emergency treatment. Vena cava ligation has been much discussed recently but its indications are few. The classical indication for this procedure is the case with bilateral phlebothrombosis or thrombophlebitis with signs and symptoms in the whole leg who continues to throw emboli despite adequate anticoagulant therapy.

IV. PATHOLOGICAL CONSIDERATIONS

This patient's history suggests that she had suffered from occlusion of a segment of the pulmonary artery with resultant changes in the lungs. At the least, such changes might be hyperæmia and œdema and at the most a true infarct of the lung. Radiological examination cannot disclose which of these two conditions is present. Because there is no evidence of previous pulmonary circulatory disturbance, it seems probable that hyperæmia and œdema only occurred in this case, a condition which would clear up in a month or two leaving no trace.

Two possibilities exist as to the cause of occlusion of a pulmonary artery in such a patient. A very unlikely possibility is that of a spontaneous thrombosis *in situ* in a pulmonary artery. The majority of occlusions of pulmonary arteries

found at autopsy are due to embolism of thrombotic material, and so, on a statistical basis this is most probably a case of thrombosis of a systemic leg vein followed by pulmonary embolism, the initial complaint of such a course of events in this particular patient.

It is important then to determine what is the underlying pathology. Pain and tenderness in the deep calf muscle are often considered evidence of thrombophlebitis; a condition in which inflammation of the vessel wall is primary and the thrombosis secondary to the vessel damage. However, from the pathologist's standpoint thrombophlebitis is rare and it is nearly always associated with either inflammation adjacent to the vessel or the postpartum and postoperative state. Pulmonary embolism is rare under such circumstances, and when present produces a septic infarct in the lung. We believe it is more probable that a patient presenting a history similar to the case under discussion is suffering from phlebothrombosis, a condition in which thrombosis is the primary event and inflammation of the vein wall a reaction to it. This view is supported by the autopsy findings in cases of pulmonary embolism. In nearly all such cases the thrombus is a bland thrombus and only minimal inflammation occurs in the adjacent vein wall. That phlebothrombosis is a common condition is further supported by the observations of Hunter, who examined the deep leg veins in 350 consecutive autopsies, and found thrombosis of these veins in 185 of them. Only one of these was an example of thrombophlebitis. These findings have been confirmed on many occasions by extensive observations.

The next question to be answered is that concerning the etiology of so-called spontaneous thrombosis. Cases of thrombosis and pulmonary embolism fall into three main categories; namely, postoperative, post-partum, circulatory disturbances, and debilitated states. Certain alterations occurring in the blood in these conditions may determine the development of thrombosis. In this connection, Drs. Waugh and Ruddick, at McGill, using a special refined technique, have observed that the blood of patients who are prone to develop thrombosis shows increased coagulability, and putting a patient to bed for four or five days is sufficient to produce this change. Others have also demonstrated increased prothrombin concentrations in similar patients.

However, it should be pointed out that a thrombus, in its initial stages, is a laying down of platelets and not a process primarily of fibrin coagulation. To explain this initial state it has been postulated that in these conditions associated with thrombosis there is a slowing of the circulation which causes platelets to settle out on the vessel wall in much the same way that sand settles out at the mouth of the river with the flowing of the current. Others have suggested that these platelets are precipitated because there is an increased tendency of the platelets to agglutinate. The latter concept becomes important in a consideration of the mechanism of anticoagulant therapy because some anticoagulants tend to inhibit agglutination of platelets as well as to alter the coagulation process.

With respect to ligation of veins in order to prevent pulmonary embolism, it is pertinent to point out that in 50% of such patients thrombus material is found above the usual point of ligation.[1]

In many cases of death due to pulmonary embolism, death is obviously a result of plugging of the main pulmonary artery or its two main branches. In a smaller number of cases the degree of occlusion of the pulmonary circulation does not seem sufficient to account for death and no satisfactory answer has been forthcoming to explain death in these cases.

REFERENCE

1. INGRAHAM, E. S.: The Distribution of Thrombi in Veins of the Pelvis and Legs in Relation to the possible value of ligation of the Femoral Vein, *Canad. M. A. J.*, 47: 553, 1942.

QUERIES

Question. What treatment is recommended for profuse, foul-smelling, vaginal discharge which has showed no improvement using antibiotics, sulfonamides, various douches, etc.? The usual treatment for trichomonas vaginalis has been used without success.

Answer.—Profuse, foul-smelling vaginal discharge is due to a mixed bacterial infection often superimposed upon a trichomonas vaginalis, or an atrophic vaginal mucosa.

If an atrophic vaginal mucosa—seen most often in menopausal or post-menopausal women—is present, adequate thickening may be brought about by the local daily application of œstrogenic creams, such as premarin. The infection is more readily controlled if such preliminary effort is made to procure a normal mucosa.

Trichomonads can be readily proved by the suspension of some discharge in warm saline under the microscope. If present these must be eradicated by one of the better known remedies such as the nightly insertion of devegan tablets.

In addition to treatment of the underlying condition direct attack upon the bacteria which produce the odour should be attempted. Recently the use of an antibiotic powder, which can be readily insufflated into the vagina, has been tried. This is a mixture of penicillin, streptomycin and sulfadiazine and has been produced by Ayerst, McKenna & Harrison. The daily insufflation of aureomycin powder—250 mgm. in kaolin—has also been shown to be useful.

Eradication of the underlying cause—such as trichomonas vaginalis, vaginal mucosa atrophy or monilia vaginalis—followed by the daily treatment with the above powder will usually be found satisfactory. Douching is best avoided since it washes out the powder, and any medication within the solution rapidly disappears. Vaginal health may be maintained following intensive therapy by the nightly instillation of a mild acid jelly —such as Aci-jel (Ortho), for three months or more.

THE CANADIAN MEDICAL ASSOCIATION

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EDITORIAL

INFLUENZA IN CANADA*

IN June of 1950, a rather mild epidemic of virus influenza made its first appearance in Sweden and an A-prime strain was isolated from some of the cases by Dr. C. H. Andrewes and his co-workers at the World Influenza Centre in London, England. At the end of November, an influenza epidemic of a similar character was observed in Denmark, Norway and Sweden, and in December, it appeared in the northern parts of England, Ireland, and the European Continent.

In the middle of January, 1951, the epidemic made its first appearance on this side of the Atlantic, when influenza was reported in forty patients at Grand Falls, Nfld. Further reports of influenza epidemics followed within a week from North Battleford, Sask., and Winnipeg, Man. At the beginning of February, the epidemic had spread across Canada. Reports from all provinces indicated that the disease was relatively mild and only a very few serious cases were observed in very young children and among the aged and infirm.

The Canadian Influenza Information Centre, which was recently established at the Laboratory of Hygiene, Department of National Health and Welfare, Ottawa, received representative samples of throat washings from all Departments of Health of the provinces in which the epidemic was prevalent and the identification of the virus, responsible for the current epidemic was established at this Centre. It was found that the epidemic was caused by an A-prime strain of influenza virus, which is closely related to, if not identical with, the A-prime strain recovered during the current epidemic in the United Kingdom.

However, these A-prime strains are only slightly related to A-prime strains recovered on the American continent in previous years and it is, therefore, questionable that vaccines containing the American A-prime strains will give reasonable protection against the strains of virus causing the present epidemics. No vaccines containing the newly isolated strains of A-prime are commercially available as yet.

* This material was kindly supplied by Dr. F. P. Negler, Head of the Virus Section, Department of National Health and Welfare, Ottawa.

RHEUMATOID ARTHRITIS

THE etiology of rheumatoid arthritis is still in doubt. There are factors about whose importance there has been general agreement in the past, including its familial tendency, the frequency of emotional shock preceding its onset, and its frequent remission during pregnancy and jaundice. The etiological importance of infection has long dominated the field.

Essentially this disease is a chronic inflammatory condition, systemic in nature and characterized by the manner in which it involves joints. Many of its clinical and pathological manifestations are similar to those seen in other systemic diseases, which may suggest a relationship and has led many to group them collectively under terms such as collagen diseases, etc. Such designations merely imply conspicuous anatomical alterations of some connective tissue constituents in a systemic manner.

Recent work by Hench and others shows that the nature and the severity of the inflammatory process can be affected by a mechanism which may be related in part to the pituitary-adrenal system. Present information indicates, however, that neither ACTH nor effective adrenal hormones can eradicate the disease. There is no evidence to show that a temporary or a long-standing adrenal or pituitary hypofunction plays any part in initiating and maintaining the inflammatory process. The manner in which these hormones hold rheumatoid arthritis in abeyance is not known. They appear to diminish the inflammation due to hypersensitivity and have an equally beneficial effect on the inflammation due to beryllium. Experimentally an inhibition of granulation tissue formation has been reported. These observations, even though of great interest, do not suggest any apparent relationship to the pathogenesis of rheumatoid arthritis.

Meyer, in 1947, showed that rheumatoid inflammation occurs chiefly in tissues known to contain complex polysaccarides, such as hyaluronic acid. Subsequent reports showed a low

concentration of hyaluronic acid with a low viscosity in rheumatoid fluids. The relation of this to the inflammatory process is still uncertain. Information regarding early alterations in tissues with subsequent changes may well establish that the change in hyaluronic acid results from insufficient synthesis or breakdown due to lack of a specific enzyme. Clark very appropriately suggests that new methods are needed for better definition of structural alterations and abnormalities of ground substance in terms of physical and chemical composition and enzymatic activity.

The clinical manifestations of rheumatoid arthritis can subside completely. However, we lack information on the degree of reversibility of the tissue changes. The inflammatory lesions are markedly altered but apparently do not disappear completely in either natural or in hormone induced remissions. Further data regarding this point are needed and may prove of etiological significance.

Much research remains to be done in this field. Work now developing, such as the implication of the pituitary somatotrophic hormone as suggested by Selye, may provide the key to the ultimate solution of the problem of etiology in rheumatoid arthritis, and possibly in other rheumatoid syndromes. A.H.N.

BLOOD FOR THE ARMED FORCES AND CIVIL DEFENCE

ON February 9, 1951, the Hon. Brooke Claxton, Minister of National Defence, announced that he had requested the Canadian Red Cross Society to undertake the supply of blood and blood products for the medical departments of the three Armed Forces. In designating the Red Cross as the agency to assume this heavy responsibility, Mr. Claxton recalled that his department had a similar arrangement with the Society during the recent war, when over 2,500,000 bottles of blood were collected by the Red Cross from volunteer donors in all parts of Canada.

With a brigade now on active service, the Department of National Defence requires at least 10,000 bottles of dried plasma during the current year. In event of more extensive mobilization, the needs of the Armed Forces would be much greater, to say nothing of the potential requirements in an adequate civil defence program. With the threat of atomic attack the demands for whole blood, quite apart from plasma, are likely to reach astronomical proportions.

The Canadian Red Cross Blood Transfusion Service is now operating in eight of our ten provinces although it is limited to the Hamilton-Niagara Peninsula area in Ontario and to that section of the Province of Quebec west of Three Rivers. It is scheduled to open in the Province of Saskatchewan this year.

The Canadian Red Cross Society is aiming to collect, during 1951, at least 100,000 bottles of blood over and above its present commitments to civilian and veterans' hospitals, currently running at approximately 210,000 bottles annually. This should not only meet the immediate needs of the Armed Forces but should assist in initiating stockpiling for civil defence. It is hoped that the public will make this vital project financially possible by over-subscribing the Society's current quota of $5,000,000, which was set some time ago before this urgent appeal of the Minister of National Defence was received.

Under its agreement with the Department of National Defence, the Society will provide not only bottles of dried plasma, encased in tins to prevent deterioration, but the sterile administration sets and pyrogen-free distilled water for reconstitution of the dried product as well. Plasma and equipment will be packaged in convenient units for storage and distribution. As during the recent war, the pooled plasma will be processed by the Connaught Medical Research Laboratories, University of Toronto, but as an additional safeguard will now be irradiated by the Levinson technique to obviate the danger of homologous serum jaundice.

This program will obviously require the participation of a large number of additional blood donors from all provinces where the service is now in operation. It is planned to appeal for blood donors in all parts of Ontario as well for purely military needs. This will necessitate the full-scale operation of the Society's laboratories at Chorley Park Military Hospital in addition to all its provincial depots now commissioned.

For this new project of the Canadian Red Cross Society, undertaken in the national interest, the whole-hearted co-operation of the medical profession is respectfully requested.

Not only may they assist in this program by reducing their transfusion therapy to an absolute minimum, but their influence in their own communities can do much to stimulate the enrolment of thousands of additional blood donors without whom the project cannot be successful. W.S.S.

EDITORIAL COMMENT

L'Union Médicale du Canada

The issues of November, 1950, and of January 1951, of *L'Union Médicale du Canada,* are devoted entirely to pædiatric subjects by French-Canadian pædiatricians. The fifty articles in the two issues represent a panorama of modern pædiatric problems, dealing with subjects varying from Prematurity to Modern Psychology, and from Training Programs to Hospital Planning, and are in a great measure a tribute to the significant advances made by our French-Canadian colleagues in Pædiatrics generally. The articles are all on a high scientific level and comprising, as they do, an overall picture of pædiatric thought, our French pædiatric colleagues and the Editorial staff of *L'Union Médicale du Canada* merit our felicitations. A.G.

MEN and BOOKS

DR. JOHN CLARENCE WEBSTER

Fred O. Priest, M.D.
Chicago, Ill.

[*We are glad to publish the following additional account of a notable Canadian surgeon. This was presented on October 30, 1950, at the annual meeting of The Canadian Gynæcological Travel Society, a small but select group which, originating in Montreal, knows no international boundaries.*—EDITOR.]

To find a subject not essentially medical, of interest to a group of distinguished obstetricians and gynæcologists of Canada, to my own colleagues and friends, is not an easy assignment. Our avocations and hobbies are so diversified that a topic of great interest to one of us may be boring to another. I have, therefore, tried to select a subject of which both you and we may claim joint ownership. The subject, a man, born one of you, spent his early life in Canada, came to us and, more specifically, to our own medical college and hospital and, after twenty years of arduous and devoted service here, returned to Canada to give to you the remainder of his busy life. This man, of course, was Dr. John Clarence Webster. While it was not my privilege to know Dr. Webster, those who did will remember him as a man of outstanding personality, a human dynamo until the day of his death.

John Clarence Webster, of Scottish and Yorkshire stock, was born in Shediac, New Brunswick, October 21, 1863. His early education was at the Westmoreland County School where he developed a great admiration for his teacher, Mr. D. B. White, who had been educated in Edinburgh. This teacher and Webster's father were the incentive for his own later medical education in Edinburgh. He entered Mount Allison at the age of fifteen. Here little is recorded except that he had a definite dislike for Latin and Greek, which he always considered a waste of time. An Arts degree was received at the age of 19 and Webster planned to begin the study of medicine in Edinburgh in the fall of 1882. Illness, however, detained his admission there until the following year. In Edinburgh he found an atmosphere quite different from that in which he had lived. The university was at the height of its fame and had an extremely large enrollment. A five-year course was offered, after which the Master of Surgery and Bachelor of Medicine degrees were given, two years' additional work being required if the Doctor of Medicine degree was given. Webster found the competition keen and the professors superb at Edinburgh. In 1890 he received the degree of Doctor of Medicine and was awarded the gold prize for original work. He was stimulated by meeting the many famous visitors to the university, the great names in medicine, the arts and letters. He was a shy fellow and had taken little part in student activities. But this had given him much time to explore the city and for the study of Scottish history. This early study was to show its influence in his later life.

Shortly after his graduation he was appointed assistant to Sir Alexander Simpson, Professor of midwifery. He seemed marked as Simpson's successor for he remained in this capacity for six years. He had come to feel himself a part of Edinburgh and planned to make it his permanent home. Illness, a chronic upper respiratory infection, influenced him to leave, however, and he returned to Canada where he became demonstrator in gynæcology at McGill University and assistant gynæcologist at the Royal Victoria Hospital in Montreal. Here he developed septicæmia from an infected patient. This influenced him to introduce the use of rubber gloves in surgery, a technique which he brought with him to the Presbyterian Hospital.

In 1899 Dr. Webster accepted the professorship of obstetrics and gynæcology at Rush Medical College of the University of Chicago and the chairmanship of those departments in

the Presbyterian Hospital. Shortly before coming here he was married to Alice Lusk, the daughter of William T. Lusk, an eminent New York obstetrician. In Chicago Webster found an atmosphere very different from that to which he had been accustomed. Here was a spirit of newness; new ideas and initiative were encouraged and he stated that he found a group of colleagues comparable to those with whom he had worked in Edinburgh. He was welcomed by the heads of the other departments and was given a free rein in the development of his own department. This he conducted with an iron hand. His keen intellect, unlimited energy, advanced surgical principles and deft technique brought him prompt recognition and a large and remunerative surgical practice. He spared himself no pains and accepted no excuses for mediocrity in others. He was a difficult taskmaster but always in the interest of the patient or of accurate teaching. His department was soon well organized and much of the didactic teaching was left to his subordinates. Thus he obtained more time in which to carry on his research, the development of an excellent departmental museum and the writing of medical papers and books. He had been and continued to be a prolific writer. He had published five books or monographs on obstetrics or gynæcology while in Edinburgh and he published five additional ones during his first eight years in Chicago. His original work on human placentation, on ectopic pregnancy, and on the anatomy of pregnancy through serial sections gave him world renown. Many of the beautiful illustrative drawings in his papers were done by himself or his accomplished wife. He published 65 medical papers during his stay in Chicago.

I think that you should know something of Webster, the man, while here. He had a great fear of upper respiratory infections and always tried to avoid being chilled. In the operating theatre he was quite unpopular. Besides the warmth of the surgical attire and the room, he could easily increase his temperature by the smallest irritations. At the end of each surgical case a large blanket was brought to him and he draped himself somewhat like "Standing Bull"—hence he was soon designated as "The Chief" in more senses than one.

He enjoyed the distinction of having more interns quit his service, or threaten to do so, than any other head of a department. After one of his episodes in surgery, a red-haired Scottish intern reached into the instrument tray and picked out a hanging speculum. "And what do you intend to do with that?" asked Webster. When told that he knew very well what he intended to do with it, Webster replied: "Come, come, my boy, one damned fool in the operating room is enough." On another occasion the intern who was giving anæsthesia for Webster became somewhat irritated with his continual nagging and said: "Doctor Webster, if you'll attend to your end of the patient, I'll take care of my end." When Webster later began to limit his obstetrical practice he referred many of his patients to this man. Once he was out of the operating rooms he became himself again and really enjoyed the respect and admiration of his subordinates.

He enjoyed the meetings of the faculty and staff, these being educational in value, but found many of the medical society meetings unprofitable. At the latter he was a severe critic, particularly at the Chicago Gynæcological Society. The younger essayists were always pleased when he was absent for he demanded proof of any statement made.

Webster did very little socially while in Chicago—both because his program of work was so heavy and because he chose not to do so. But it was here that he and Mrs. Webster became interested in oriental art and began the collection of Japanese and Chinese art objects. This was continued for many years and became one of the most famous in the world. They later presented the collection to the New Brunswick Museum.

In 1920, at the age of 57 and at the height of his medical career, he abruptly withdrew from all medical activities and returned to his native Shediac, New Brunswick, and resumed his Canadian citizenship. He had offered his services to the Canadian Medical authorities in 1941 and to the United States authorities in 1917 but had not been accepted. Many of the younger men were in service and he had been overburdened with work during the war. His resignation was accepted with many regrets by the College and the Presbyterian Hospital.

At the age of 57 Webster was not in the best of health, had acquired a comfortable financial status, and, had he been like many of us, would have retired to a life of ease. But it was during the last thirty years of his life, after he left the field of medicine, that he accomplished those things for which he will be remembered longest and most loved. When questioned as to which of the two fields of his life had been of most interest to him he replied that he had found as much satisfaction in one as in the other, but that his historical research had carried him through the perils of old age and saved him from the horrors of doddering senility. Also it was in his second field of endeavour that he worked closely with Mrs. Webster and spent most of his time with her. It was in Edinburgh that he had first interested himself in Scottish and Canadian history, music and painting. Together they had continued these studies throughout the years. After his retirement from medicine he and Mrs. Webster devoted themselves to research in Canadian history. For ten years they visited Europe annually, studying the related archives and

laying the foundation of the "Webster Collection of Canadiana". This collection was donated to the New Brunswick Museum also, is valued at one million dollars, and is rivalled only by the collection in the National Archives in Ottawa. Mrs. Webster played an inestimable part in this work and is as tireless a worker as was her husband. Dr. Bartlett Brebner, an historian at Columbia, has said: "It is faulty mathematics to add a Webster to a Webster and get two Websters. In order to understand all they have been able to do, you multiply Webster by Webster and get Webster squared."

In 1923 Webster was made a member of the "Historic Sites and Monuments Board," an honorary group of Canadian historians to advise the government in the marking of historic sites and national historic parks. Twenty years later he was made chairman of this board and remained in that capacity until his death this year at 87 years of age. This was perhaps his most cherished appointment because of its connection with the history of Canada. In this span of his life he published 50 papers and several books, dealing with Canadian history. His thesis on the life of General Wolfe is a classic. He was largely responsible for the establishment or restoration of numerous historical museums. His favourite was perhaps the museum at Fort Beausejour. Many presentations were made here through his generosity and at his own expense. It was quite fitting that an addition to the museum in 1949 should be named 'The John Clarence Webster Wing". He has, I believe, done more for the preservation of historic sites in the Maritimes than any other man.

He received honorary degrees from five universities and honours from the governments of several countries. His active later life in Canadian history and literature was so full that many may forget his contribution to medicine but it is as a physician that we wish to remember Dr. Webster.

ADDENDUM

Since I did not have the opportunity of knowing Dr. Webster personally, I obtained my information from the following sources:

"Those Crowded Years". By J. Clarence Webster. (His autobiography, written for his children.)

Dr. Stanley Pargellis, Librarian of the Newberry Library, Chicago, a friend of Dr. Webster in his later life.

Webster's personal correspondence with Mrs. Edwin Miller of Chicago.

Various medical and historical magazines of the British Empire.

Conversations with staff members and with former interns of Dr. Webster at the Presbyterian Hospital.

MEDICAL ECONOMICS

MEDICAL SERVICES: FURTHER COMMENTS AND CONCLUSIONS

Harris McPhedran, M.D.

Toronto, Ont.

In my first paper,* I set forth my impressions of the results of the N.H.S.A. in Great Britain and ended with a summary of the benefits and defects of this experiment in Socialized Medicine. From this, we in Canada should gain valuable lessons when considering changes in the present methods of rendering medical services.

Before drawing any conclusions, however, it is timely to review: (1) The course of events regarding medical services in Great Britain since May, 1950, when I was there. (2) The situation regarding National Health Insurance in Canada. (3) Plans in New Zealand and Australia. (4) The policy of the Canadian Medical Association.

After two years of operation of the N.H.S.A. what has been the result? At the Southport meeting of the Representative Body of the B.M.A. in July, 1950, the following resolution was passed.

"That the conference instructs the General Medical Services Committee to make preparations forthwith for the termination of contracts by general medical practitioners in the N.H.S. and that if and when it becomes evident that there is no prospect of a satisfactory settlement of the claim, a conference be called to name a date at which general practitioners shall be advised to end their contracts with executive councils and that in any case a conference be called to consider the position in December, 1950, if a satisfactory settlement has not been reached by that time." (The date for withdrawal from the Service has now been advanced to March, 1951.)

Here the matter rests, the medical profession convinced that the practice of medicine has been degraded in the past two years and determined (even though conceding that the principle of insurance is sound) to effect changes leading to the betterment of general medical services.

In Canada, all national political parties have committed themselves to a policy of National Health Insurance including general health services varying in degree from partial to complete nationalization. As far as I know, the present government of Canada is still committed to the policy outlined by the late Prime Minister, Mr. Mackenzie King. In a speech to Parliament on May 14, 1948, two statements were made by him.

1. He proposed legislation, subsequently adopted by Parliament, setting aside $30,000,000 a year for the next 5 years as from May, 1948 for: (*a*) Health survey grant to determine the health needs in the provinces. (*b*) Health grants to the provinces, mostly to aid in extend-

* Medical Services in Great Britain, *Canad. M. A. J.*, **63**: 511, 1950.

ing and increasing preventive health services, and in increasing the number of hospital beds and equipment.

The health surveys have been undertaken and the reports should be available soon. The health grants have been given to the Provinces and as a result many additional hospital beds have become available and much needed equipment obtained by many hospitals.

2. He stated, however, "These above measures also represent first stages in the development of a comprehensive health insurance plan for all of Canada".

As a profession, we should not lose sight of this statement of policy of the Liberal Party.

It is perhaps not untimely to remind ourselves that there is still extant at Ottawa a Social Security Bill entitled "Health Insurance, Public Health and the Conservation of Health and the Prevention of Disease". This Bill was drawn up after a very thorough and fair investigation by the Social Security Commission appointed by the Liberal Government in 1944. It still stands and can be introduced any time that the Liberal party in power, now as then, sees fit. One hopes, however, if such happens that health services will be considered as a national problem above party politics. Is this too much to expect? One wonders how far we have progressed in our method of settling national problems since Sir Walter Scott wrote in "Peveril of the Peak".

> "Alas cousin", answered the Countess "when did Englishmen even of the highest degree remember anything when hurried away by the violence of party feeling? Even those who have too much sense to believe in the incredible fictions which gull the multitude, will beware how they expose them, if their own political party can gain momentary advantage by their being accredited."

Here is the way one layman of today looks at this question.

> "Governments win to power through the pursuit of popularity themselves. And any government may expect to win popularity with a great cross section of our people, which places your services (medical) at the public's disposal 'free of charge'. That nothing in this life is really 'free' is aside from the point. The public is inclined to be an ass in this regard and would gladly for a time make free with the many valuable services your profession has to offer."

We should not overlook the fact that we have a good deal of nationalization and socialization of health services at present. The Government of Canada provides medical care for sick mariners, navy, army and airforce personnel, pensioners of two world wars, etc. The various provinces provide medical services to injured workmen, to the welfare group and the mentally ill, to those suffering from tuberculosis, cancer and venereal diseases, etc., as well as the time-honoured and necessary preventive services in city, town and country. If we ponder these things and the policies of the various political parties we are, I believe, at the beginning rather than at the end of governmental control of Health Services. The next move, it seems, will be into the field of general medical and specialist health services.

All these observations should make us take stock of our present situation and help us to determine our course since the word "security" is on as many tongues and since the first stage in establishing "the Welfare State" has been so far, nationalization of the medical profession.

In New Zealand after several years' trial of complete nationalization of medical services which were part of the revolutionary development of the Welfare State, I found the majority of doctors with whom I talked, dissatisfied even after several revisions of the original plan had taken place. Many felt that "Social Security" was undermining that initiative and independence which characterized the pioneers of that country.

In Australia the Federal Government on the advice of Sir (Dr.) Earle Page is considering a National Health Insurance Bill. I was present at conferences of Sir Earle with the representatives of the medical profession of Australia. They approved of the Bill in principle. In my judgment, the proposed legislation is sound so far as preventive services are concerned, but whether it will work when applied to hospitals, nurses, doctors, dentists, druggists and other personnel concerned, I cannot say. At last report, some 135 drugs including sulfa drugs and antibiotics have been put on the free list so that all a patient has to do is to take the prescription from his doctor to a pharmacist and have it dispensed without any direct charge to himself. It will be interesting to see what effect the above procedure has on drug *costs*.

What is the policy of the C.M.A. regarding health insurance which has been under discussion since World War I? Certain principles have been evolved and a policy outlined.

1. Our first principle adopted at the General Meeting of Council in 1944 is as follows: "The C.M.A. approves the adoption of the principle of contributory health insurance and favours a plan which will secure the development and provision of the highest standards of health services, preventive and curative, provided the plan be fair both to the insured and to all those rendering the services."

At Banff in 1946, after the Social Security Bill had been drawn up, but not introduced in Parliament, the C.M.A. went a step further and adopted certain basic conditions for improved health services. The main principles approved in 1944 and the policy adopted in 1946 were revised and consolidated in a "Statement of Policy", which was adopted at Saskatoon, 1949. While all this has been going on, the medical profession in certain Provinces has started schemes of prepaid medical services of its own and has brought the medical profession into the field of insurance for better or for worse.

What lessons can we in Canada learn from this review of activities which have lead or are leading to socialized medicine here and in other parts of the Commonwealth?

I. Plans formulated by any government should be evolutionary in development. We have a good foundation inherited from the past on which to build. Perhaps it needs repairing here and there, but it should be as broad and complete as possible before any attempt is made to build the superstructure. What constitutes this foundation? The policy of the C.M.A. adopted at Banff in 1946 gives the essentials.

(*a*) Improved standards of living, better housing, food, clothing, facilities for recreation, etc.
(*b*) An adequate program for prevention of disease.
(*c*) Diagnostic services—x-ray, laboratories (biochemical and bacteriological, etc.), at key points throughout this country.
(*d*) Adequate hospital beds for the acutely and chronically ill, the convalescents and the insane.
(*e*) Medical and allied services in remote areas.
(*f*) Complete service for the welfare group (indigents, mother's allowance group, the blind and old age pensioners) in and out of hospital.
(*g*) Education of the public and professions alike regarding socialized medicine.

Every doctor in Canada should inform himself of the present status of health services in Canada, together with the principles and the policy of the Canadian Medical Association. Having done this, he should take the leading part in educating the public in his community, tell the truth about socialized medicine, its cost and its effect on the quality of health services that obtain in the Welfare State. If the individual doctor does not undertake this work, he need blames no one but himself if practitioners in this country are faced some day in the near or distant future with a national or provincial scheme drawn up by those who know little of the practice of medicine and less of human beings.

II. There should be an income level, "the State bearing in whole or in part the premium for those persons who are adjudged to be unable to provide the premiums for themselves", (policy of C.M.A., Saskatoon, 1949.)

III. Any plan national or provincial in scope should be administered by a non-political independent commission representing those giving and those receiving the service.

IV. All citizens should be warned that any scheme will cost money which will come out of the tax-payers' pockets, one way or another. It was heartening to hear our Federal Minister of Finance tell the Canadian people last spring that increased social security measures meant increased taxes.

V. Every wage earning citizen should pay something direct to those rendering medical services in order to prevent unnecessary home and office calls, hospitalization, drugs, etc.

VI. We must avoid, at all costs, splitting of the profession into specialists and general practitioners. This has had a disastrous effect in Great Britain. The same could happen here and is, at present, shaping in that direction. The science of medicine recognizes no such division. Every practitioner no matter what his status, has his place, large or small in the practice of medicine. Nothing is to be gained and so much will be lost, by division. Surely whatever is wrong on either side should and can be settled by free and frank exchange of views between teacher and taught, specialist and general practitioner, in our councils of organized medicine.

VII. If we are to prevent undesirable incursions (whether provincial or national), then we (this includes those receiving as well as those giving medical benefits) should be prepared to put forward a national scheme actuarially sound, developed by co-operation with those trained and experienced in the field of insurance. In so doing we will (as we should) give heed to the axiom "the shoemaker should stick to his last." which means doctors should practise medicine; business men should stick to business. Exploratory conversations have been held with representatives of the life insurance companies in Canada and investigations started which should, in time, strengthen the foundation and start the superstructure of a scheme that will appeal to all those who still believe in free enterprise and in keeping the practice of medicine individual, personal and confidential.

For the opportunity of seeing the N.H.S.A. in operation in Great Britain, I should like to thank Drs. Hill, Macrae and Sandiford of the B.M.A. Headquarters, London; Dr. Walker of Edinburgh; Dr. Grant of Glasgow; Dr. Milne of Manchester; Drs. Golding and Sutton of Bristol; Dr. Mary Myer of Stogumber. Also, may I thank my confrères in Australia and New Zealand for their valuable and helpful advice derived from experience with Socialized Medicine.

MICROSCOPE TO STUDY "INVISIBLE" LIGHT.—A new type of microscope developed by research workers of Bristol University, England, replaces glass lenses by curved mirrors, the advantage being that, whereas lenses reflect only visible light, mirrors reflect all radiation. Another advantage is that the new microscope is completely free from the tendency—found in conventional microscopes—for coloured "fringes" to appear around the image of the object being examined.

Preliminary Program

Canadian Medical Association

EIGHTY-SECOND ANNUAL MEETING

MONTREAL, JUNE 18–22, 1951

President—Dr. Norman H. Gosse, Halifax.
President-Elect—Dr. Harcourt B. Church, Aylmer, Que.
General Secretary—Dr. T. C. Routley, Toronto.
Assistant Secretary—Dr. A. D. Kelly, Toronto.
Local Hon. Secretary—Dr. G. Earle Wight, Montreal.

(This meeting is held in conjunction with the 13th Annual Meeting of the Quebec Division.)

Arrangements for the 82nd Annual Meeting to be held in Montreal during the week of June 18 are proceeding satisfactorily. General Council will meet on Monday, June 18. On Tuesday evening the members of General Council and their wives will be dinner guests of the Quebec Division. A series of round table conferences has been arranged for the mornings of Wednesday, Thursday, and Friday, from 9.00 until 10.00, to be followed by general sessions. The newly introduced feature of Colour Television will be shown on Wednesday, Thursday, and Friday afternoons. There will also be some sectional meetings on these afternoons of a more general nature. The Annual General Meeting will be held on Wednesday evening, June 20, at 8.30 o'clock. On this occasion the retiring president, Dr. N. H. Gosse, will hand over the badge of office to Dr. H. B. Church.

Wednesday, June 20, 1951

ROUND TABLE CONFERENCES

9.00 – 10.00 a.m.

1. *Postoperative Care.*
   Chairman—Dr. Campbell Gardner, Montreal.
   Discussers—Dr. W. H. Philip Hill, Montreal; Dr. S. A. MacDonald, Montreal; Dr. R. G. B. Gilbert, Montreal.
2. *Fatigue.*
   Chairman—Dr. T. E. Dancey, Montreal.
   Discussers—Dr. R. A. Cleghorn, Montreal; Dr. G. E. Hobbs, London; Dr. Allan Walters, Toronto; Dr. J. D. Adamson, Winnipeg.
3. *Common Skin Problems in Children.*
   Chairman—Dr. Norman Wrong, Toronto.
4. *Dizziness.*
   Chairman—Dr. W. J. McNally, Montreal.

10.15 – 11.45 a.m.

General Session

1. *Valedictory Address.*
   Dr. Norman H. Gosse, Halifax.
2. *Episiotomy.*
   Dr. N. J. Eastman, Baltimore.
3. *The Lister Lecture — Lister and the History of Medicine.*
   Dr. Donald C. Balfour, Rochester, Minn.

2.15 – 4.30 p.m.

Session A

1. *Fractures of the Shaft of the Femur—Treatment by Kuntscher's Intramedullary Nail.*
   Dr. F. P. Dewar, Toronto; Dr. R. I. Harris, Toronto.
2. *The Problem of Infertility.*
   Dr. Edwin M. Robertson, Kingston.
3. *The Prevention of Pulmonary Embolism.*
   Dr. John A. McLachlin, St. Thomas.
4. *Recurrent Urological Problems faced by the General Practitioner.*
   Dr. S. A. MacDonald, Montreal.

SECTIONAL MEETINGS

Section of Historical Medicine

1. *The Lot of Few Men.*
   Dr. J. R. Bayne, Montreal.
2. *Dr. James Hector—Leading Spirit of the Palliser Expedition.*
   Dr. Ross Mitchell, Winnipeg.
3. *John Antle.*
   Dr. Honor Kidd, Vancouver.
4. *Student Discoverers.*
   Dr. Wm. C. Gibson, Vancouver.

Section of Ophthalmology and Otolaryngology

1. *Nasal Sinusitis.*
   Dr. G. E. Tremble, Montreal.
2. *A Survey of Hereditary Glaucoma.*
   Dr. Lloyd Probert, Toronto.
3. *The Appearance of the Fundus Oculi in Hypertension.*
   Dr. K. B. Johnston, Montreal.
4. *Ear Ache.*
   Dr. E. J. Smith, Montreal.
5. *The Importance of Early Diagnosis and Treatment of Strabismus.*
   Dr. Jules Brault, Montreal.

Thursday, June 21, 1951

ROUND TABLE CONFERENCES

9.00 – 10.00 a.m.

1. *The Painful Shoulder.*
   Chairman—Dr. Wallace Graham, Toronto,
   Discussers—Dr. H. F. Moseley, Montreal; Dr. R. Ian Macdonald, Toronto; Dr. Jean Bouchard, Montreal; Dr. Roderick Gordon, Toronto.
2. *The Place of Surgery in the Treatment of Hypertension.*
   Chairman—Dr. K. A. Evelyn, Montreal.
3. *The Obstetrical and Pædiatric Management of the Premature Child.*
   Chairman—Dr. Alton Goldbloom, Montreal.
   Discussers—Dr. Newell Philpott, Montreal; Dr. D. E. Cannell, Toronto; Dr. Harry Medovy, Winnipeg; Dr. Albert Royer, Montreal.
4. *Urethral and Vaginal Discharge in the Female.*
   Chairman—Dr. H. G. Hall, Toronto.

GENERAL SESSION

10.15 – 11.45 a.m.

1. *Post Traumatic or Infectious Localized Serous Meningitis.*
   Dr. Jean Sirois, Quebec.
2. *The Use and Abuse of Anti-biotics.*
   Dr. Chester S. Keefer, Boston.
3. *Some Common Electrolyte Disturbances.*
   Dr. Martin M. Hoffman, Halifax.

SECTIONAL MEETINGS

2.15 – 4.30 p.m.

Section of Anæsthesia

1. *The Use and Misuse of Intravenous Anæsthesia.*
   Dr. Fernando Hudon, Quebec.
2. *The Use of Curarising Drugs.*
   Dr. E. H. Watts, Edmonton.
3. *Safe Anæsthesia in Obstetrics.*
   Dr. Alan Noble, Kingston.
4. *Anæsthesia for Children.*
   Dr. Ivan Junkin, Toronto.

Armed Forces Medical Section

1. *The Problem of Blood and Blood Substitutes.*
   Dr. R. L. Denton, Montreal.
2. *Experiences on Tour of Duty in Korean Waters.*
   Surgeon-Lieutenant Bruce Ramsey.
3. *Planning for Disaster.*
   Dr. Kenneth C. Charron, Ottawa.

Sections of Industrial and Preventive Medicine

1. *The Internist and His Contribution to Health Maintenance in Industry.*
   Dr. Eustace Morin, Quebec.
2. *The Stress Factor in Industry.*
   Dr. Hans Selye, Montreal.
3. *The Relationship of Occupation to Cancer, with Emphasis on Trauma.*
   Dr. William Boyd, Toronto.
4. *Business Meetings of both Sections.*

Section of Medicine

1. *The Problem of Hypothyroidism in Practice.*
   Dr. Norman Skinner, Saint John.
2. *Clinical Differentiation between Organic and Psychogenic Illness.*
   Dr. Gilbert Adamson, Winnipeg.
3. *The Treatment of Angina Pectoris.*
   Dr. John Palmer, Montreal.
4. *Obesity.*
   Dr. Jean Grignon, Montreal.

Section of Obstetrics and Gynæcology

1. *Resuscitation of the New Born.*
   Dr. J. L. McArthur, Montreal.
2. *The Management of the Pregnant Diabetic Patient.*
   (*a*) The Medical Aspect—Dr. F. S. Brien, London.
   (*b*) The Obstetrical Aspect—Dr. Alex. Agnew, Vancouver.
3. *Obstetrical Problems in General Practice.*
   Dr. L. T. Armstrong, Toronto.

Section of Pædiatrics

1. *The Diagnosis and Treatment of Surgical Emergencies in Infants in the First Five Days of Life.*
   Dr. D. E. Ross, Montreal.
2. *The Erythroblastotic Infant.*
   Dr. C. E. Snelling, Toronto.
3. *The Management of Infections in the Allergic Child.*
   Dr. A. G. Denison, London.
4. *Phrenic Crush as an Aid in the Treatment of Omphalocæle (Experimental Clinical Evidence).*
   Dr. Herbert Owen, Montreal; Dr. D. E. Ross, Montreal.

Section of Psychiatry

1. *Psychotherapy and the General Practitioner.*
   Dr. Ewen Cameron, Montreal.
2. *The Treatment of Psychosomatic Illness in a General Hospital.*
   Dr. Allan Walters, Toronto.
3. *Program of the University of British Columbia, Crease Clinic Research Unit.*
   Dr. William C. Gibson, Vancouver.
4. *Report on the Formation of the Canadian Psychiatric Association.*
   Dr. G. H. Stevenson, London.

Section of Radiology

1. *Some Aspects of Work with the Betatron.*
   Dr. T. A. Watson, Saskatoon.
2. *Dislocations of the Carpal Scaphoid with and without Fracture.*
   Dr. E. F. Crutchlow, Montreal; Dr. J. G. Shannon, Montreal.
3. *The Clinical Significance of Abnormalities in the Upper Cervical Region.*
   Dr. Norman M. Brown, Montreal.
4. *A Complex of X-ray Signs Leading to Diagnosis of Gastro-œsophageal Varices.*
   Dr. Albert Jutras, Montreal.

Section of Surgery

1. *Treatment of Coronary Artery Insufficiency by Implantation of the Internal Mammary Artery into the left Ventricular Myocardium.*
   Dr. Arthur M. Vineberg, Montreal.
2. *Peripheral Nerve Injuries.*
   Dr. James E. Bateman, Toronto.
3. *The Management of Abdominal Injuries.*
   Dr. C. W. Burns, Winnipeg.
4. *Ulcerative Lesions of the Stomach.*
   Dr. A. W. Hardy, Edmonton.

Friday, June 22, 1951

9.00 – 10.00 a.m.

ROUND TABLE CONFERENCES

1. *Practical Uses of ACTH and Cortisone.*
   Chairman—Dr. J. S. L. Browne, Montreal.
   Discussers—Dr. A. Bagnall, Vancouver; Dr. K. J. R. Wightman, Toronto; Dr. Bram Rose, Montreal; Dr. M. M. Hoffman, Halifax.
2. *The Diagnosis of Acute Abdominal Conditions.*
   Chairman—Dr. Albert Jutras, Montreal.
   Discussers—Dr. T. J. Quintin, Sherbrooke; Dr. A. D. McLachlin, London.
3. *Rehabilitation—Problems Common to the General Practitioner and the Industrial Physician.*
   Chairman—Dr. W. H. Cruickshank, Montreal.
   Discussers—Dr. Harold N. Segall, Montreal; Dr. H. G. Ross, Montreal; Dr. Roland Martel, Ste-Martine; Dr. Gustave Gingras, Montreal; Dr. Jean Tremblay, Montreal.
4. *The Utilization of Medical Man Power in Time of National Emergency.*
   Chairman—Dr. H. M. Elder, Montreal.

10.15 – 11.45 a.m.

General Session

1. *Diagnosis and Management of Chronic Liver Disease.*
   Dr. L. G. Bell, Winnipeg.
2. *Transmyocardial Palpatory Surgery.*
   Dr. Charles P. Bailey, Philadelphia.
3. *The Adaptation Syndrome.*
   Dr. Hans Selye, Montreal.

2.15 – 4.30 p.m.

Session B

1. *The Management of the Menopause.*
   Dr. Ross Vant, Edmonton.
2. *ACTH in the Treatment of Leukæmia in Childhood.*
   Dr. W. L. Donohue, Toronto.
3. *Radioactive Iodine.*
   Dr. MacAllister W. Johnston, Toronto.
4. *The Relationship of Hyperplastic Epithelial Changes in the Breast to Carcinoma.*
   (*a*) Pathological Standpoint—Dr. Theo R. Waugh, Montreal.
   (*b*) Clinical Standpoint—Dr. R. N. Lawson, Montreal; Dr. J. C. Armour, Montreal.

Colour Television Program

The following program will be shown on colour television. The various subjects will be taken up over three days, to be described in the final program.

Surgical Operations

1. Gastrectomy	Dr. G. Gavin Miller
2. Cæsarean Section	Dr. Newell Philpott
3. Radical Mastectomy	Dr. Robert Janes
4. Supracondylar Amputation	Dr. J. C. Luke
5. Cholecystectomy	Dr. A. L. Wilkie
6. Repair of Hare Lip	Dr. Hamilton Baxter

The remainder of the program is as follows:

7. Lesions of the Mouth	Dr. S. J. Martin
8. Maltreatment in Hand Injuries	Dr. F. M. Woolhouse
9. Post-laryngectomy Speech	Dr. E. E. Scharfe
10. A Neurological Diagnosis	Dr. Wilder Penfield
11. Commissurotomy for Mitral Stenosis	Dr. E. D. Gagnon
12. Demonstration of Dermatological Cases	Dr. A. Marin and Dr. Georges Leclerc
13. Rehabilitation	Dr. G. Gingras
14. Arthritis	Dr. Jacques Durivage
15. Pulmonary Function Evaluation	Dr. Fernand Gregoire
16. Electro-shock Therapy	Dr. Jean-Leon Desrochers
17. Local Anæsthesia for Office Use	Dr. Louis Lamoureux
18. Endocrine Disorders	Dr. Allen Gold
19. Distribution in Dermatological Disease	Dr. L. P. Ereaux and Dr. Roy Forsey
20. Glaucoma	Dr. R. J. Viger
21. Allergic Reactions to Adrenalin	Dr. H. S. Mitchell
22. The Premature Baby	Dr. Alan S. Ross
23. Presentation of Quadruplets by a General Practioner	Dr. John MacDonald
24. The Treatment of Infected Bones	Dr. J. G. Shannon

General Practitioners Section

A breakfast meeting of the executive committee of the General Practitioners Section will be held at 7 a.m. on Wednesday morning, June 20, in the Mount Royal Hotel. At this meeting the committee will review the business to be considered at the annual meeting of the Section to be held on Saturday, June 23.

Artists, Photographers Invited to 7th Physicians' Art Salon

All Canadian physicians and medical undergraduates with art or photography as a hobby are invited to exhibit some of their work at the 7th annual Physicians' Art Salon, to be held in Montreal from June 18 to 22, in conjunction with the Convention. All entries in the divisions of fine arts, monochrome photography, and colour transparencies will be displayed on the convention floor and judged for awards by a panel of outstanding Canadian artists.

Again sponsored by Frank W. Horner Limited, the salon is expected to attract a large number of enthusiasts in the various media. Organized originally to foster restful pursuits in the profession, the Physicians' Art Salon has aroused widespread interest across the Dominion and has become a form at which artistically gifted physicians can exhibit the produce of their leisure hours before an interested medical audience.

To Enter

Anyone interested in entering work is urged to notify Frank W. Horner Limited, 950 St. Urbain Street, Montreal, who will furnish full details and the necessary entry form. A short note or postcard will do. All expenses, including the transportation of exhibits to and from Montreal, will be borne by Horner.

Deadline

Entry forms must be completed and in the hands of the sponsor before May 30 to ensure proper listing of exhibits in the catalogue. Exhibitors are also asked to ship entries far enough in advance to allow for the inevitable delays in express and parcel post. Full shipping instructions appear on the entry form.

Reduced Fares for Rail Travel to the Annual Meeting

The Canadian Passenger Association has authorized special convention rates for members of the Canadian Medical Association and their families travelling by rail to the Annual Meeting in Montreal. Identification certificates permitting members to purchase tickets at a considerable saving may be obtained on application to the General Secretary, Canadian Medical Association, 135 St. Clair Avenue West, Toronto 5, Ontario.

Dates of Sale

From points in Eastern Ontario (*i.e.*, Ft. William, Armstrong, Ontario, and east thereof) June 11 to 20, inclusive; except when from points in Newfoundland they will be June 8 to 17, inclusive.

From points in Western Canada, round trip tickets will be issued as follows:

From British Columbia—June 7 to 16 inclusive.
From Alberta—June 8 to June 17, inclusive.
From Saskatchewan—June 9 to 18, inclusive.
From Manitoba and Ontario (West of Ft. William and Armstrong, Ont.)—June 10 to 19, inclusive.

Continued on page 360

FOR YOUR WIFE . . .

A lively round of activities at the C.M.A. Convention in Montreal

MONDAY, JUNE 18—

For wives of Council Members

10.30 a.m.—Departure for Alpine Inn Luncheon

A pleasant fifty mile drive into the Laurentians to the attractive Alpine Inn. Private cars will be provided. Warmer clothing may be needed for the trip. Invitations (R.S.V.P.) to this luncheon will be sent out in advance.

TUESDAY, JUNE 19—

For wives of Council Members

2.30 p.m.—Museum of Fine Arts Tour

Following the conducted tour of the galleries, the Ladies' Committee of the Montreal Museum of Fine Arts will entertain at tea.

7.00 p.m.—General Council Dinner

For Council Members and their wives—dress optional.

WEDNESDAY, JUNE 20—

First day of General Sessions

Committee members will be at the Registration Desk all day to advise on places to see, interesting places to eat and things to do.

2.00 p.m.—Sightseeing Tour of Montreal

8.30 p.m.—Annual General Meeting.

For all members and their wives this is the impressive function at which the new President of the Canadian Medical Association is installed with fitting ceremony. Dress is formal.

10.00 p.m.—President's Reception and Dance

THURSDAY, JUNE 21—

12.30—Luncheon and Fashion Show at the Ritz Carlton Hotel

"Fashion is International" is the title of the Fashion Show to be conducted by Mrs. Doreen Day, Promotion and Fashion Director, The T. Eaton Company Limited of Montreal. Mrs. Day is herself an international fashion authority. Her wit and charm have made her one of the most sought-after fashion commentators on the continent.

5.00 p.m.—Civic Reception at the Chalet on Mount Royal

FRIDAY, JUNE 22—

10.30 a.m.—Informal Farewell Coffee Party

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Golf.—Games will be made up and arrangements made for playing privileges at any of the courses around Montreal. Tournament plans will be announced.

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See the May issue for additional events and details

POUR VOTRE FEMME . . .

Un programme attrayant et varié durant le Congrès de l'A.M.C. à Montréal

LUNDI, 18 JUIN—

Pour les femmes des membres du Conseil

10.30 a.m.—Départ pour un déjeuner au Alpine Inn

Une agréable randonnée de 50 milles dans les Laurentides jusqu'au Alpine Inn, en voitures particulières. Des vêtements chauds sont indiqués pour ce voyage. Les invitations à ce déjeuner seront envoyées à l'avance, R.S.V.P.

MARDI, 19 JUIN—

Pour les femmes des membres du Conseil

2.30 p.m.—Visite du Musee des Beaux-Arts

Après une visite commentée, dans les salles d'exposition, le Comité féminin du Musée des Beaux-Arts de Montréal offrira le thé.

7.00 p.m.—Dîner du Conseil

Pour les membres du Conseil et leurs femmes. —L'habit est facultatif.

MERCREDI, 20 JUIN—

Premier jour des réunions plénières

Les membres du Comité se tiendront au pupitre d'inscription toute la journée, pour suggérer aux dames: que voir, où manger, que faire.

2.00 p.m.—Visite de la ville en autocar

8.30 p.m.—Assemblée plénière annuelle

Pour tous les membres et leurs femmes, un évènement d'importance: l'installation du nouveau Président de l'Association Médicale Canadienne, marquée par une cérémonie appropriée. L'habit est de rigueur.

10.00—Réception du Président et danse

JEUDI, 21 JUIN—

12.30 p.m.—Déjeuner et Parade de Modes à l'Hotel Ritz-Carlton

"La Mode est internationale" Revue de modes présentée par Mrs Doreen Day, Directrice des Modes à la Maison Eaton de Montréal. Mrs Day est elle-même un expert international en modes. Son esprit et son charme font d'elle un des commentateurs de modes les plus recherchés de tout le continent.

5.00 p.m.—Réception municipale au Chalet du Mont-Royal

VENDREDI, 22 JUIN—

10.30 a.m.—Café d'adieux, sans cérémonie

—— • ——

Golf: Des parties de golf seront organisées et des arrangements seront faits pour l'utilisation des terrains de golf autour de Montréal. Les projets de tournois seront annoncés.

La livraison de mai contiendra des détails supplémentaires sur le programme.

Fare Basis (Adult)

Round trip tickets will be sold at one and one-half of the normal adult one way first class, or coach class fares, plus 25c, upon presentation and surrender of Identification Certificate to ticket agents.

Return Limit

Tickets sold on the above basis will bear final return limit of thirty days after the date on which ticket is valid to start the going journey, and passengers must reach original starting point not later than midnight of final return limit.

Registration

Registration certificates enabling members to claim deductions for Income Tax purposes will be mailed to all members who register at the Annual Meeting. It is important therefore that those who wish to have certificates make sure that they register upon arrival at the Meeting. Certificates cannot be provided to doctors who have not registered.

MEDICAL SOCIETIES

Section of General Practice

The first midwinter meeting of the executive of the Section of General Practice was held in Toronto, February 26 to 28, 1951. Representatives from nine Provinces were present and several guests including Drs. Ray Brow, Montreal, Dean J. A. MacFarlane, R. F. Farquharson, C. D. Farquharson, J. T. Hauch and H. G. Hall, of Toronto; Drs. Struthers and L. O. Bradley; Drs. A. Sturgeon and J. Mather, Ontario Department of Health; Dr. E. C. Long of the American Academy of General Practice; Mr. Bruce Buchanan of CAMSI.

The chairman, Dr. Victor Johnston of Lucknow, Ont., dwelt on the growing desire in most civilized communities to provide better general practitioner service. In the United States an Academy of General Practice had been formed. In Great Britain a section of general practice had been developed within the Royal Society of Medicine with the idea of narrowing the gap which tends to develop between general practice and the specialists, and to keep alive the scientific aspect of medicine which may be lost sight of in general practice. Now Dr. Johnston felt that there was a definite Canadian scene to be considered, and it should be looked at from a Canadian point of view, with a resulting Canadian solution. We should look abroad and profit both by the mistakes and the successes of others.

The work of the meeting fell into two main divisions; (*a*) the organization of the Section; (*b*) the presentation of some problems confronting the development of general practice along the most desirable lines.

It was made clear that the Section was unanimously and deeply anxious to remain within the framework of the Canadian Medical Association. This was all the more significant because of the almost complete provincial representation. It was immediately recognized that the suggested organization of the Section needed wide revision, but eventually it was found that there were no insurmountable difficulties in this. The really difficult and important matter was that concerning the standards for membership in the Section. It was impossible to arrive at a final decision on this at the moment. The assistance of the entire executive of the parent body was essential for this.

There were two avenues of approach, as suggested by Dr. G. G. Ferguson of Saskatoon.

(*a*) It might be done by certification in academic subjects: this would require a new incorporated certifying body, or the use of one of the existing bodies of this nature.

(*b*) There might be a certificate or acknowledgment of merit by fellow practitioners involving such things as proficiency in work, attendance at postgraduate courses, etc. How this would be done would need study.

Amongst the contributions on general practitioner problems those of Dean J. A. MacFarlane and Dr. Ray Brow were outstanding. They dealt particularly with internship training for general practice. Dr. Brow dealt on the need for supplementing the instruction of teaching hospitals with the experience of general practice. Excellent papers were also presented by Drs. Sturgeon and Mather on the relation between the general practitioner and the work of the public health department in preventive medicine.

It was felt that this three day meeting had entirely warranted the effort and expense it entailed. It is hoped that there will be more concrete evidence of the organization of the Section at the Annual Association meeting in June.

CORRESPONDENCE

Cytological Diagnosis

To the Editor:

An article by Dr. Magner in the C.M.A. Journal decrying the cervical scraping aid in the diagnosis of early Ca. of the uterus almost drove me into print, however, it was replied to so well by Drs. Ayre and Kulcsar, that my remarks were unnecessary. Recently, an article by Dr. Henderson of Toronto in the December Journal calls for a "cytological" reply. First: Both these doctors insist on calling the procedure a "vaginal smear", whereas the present technique is nothing of the sort but is a "surface scraping biopsy" of the squamo-columnar area of the cervix, the area where early Ca. is most likely to develop. Second: Both Dr. Magner and Dr. Henderson barely mention, in their references, the name of the man who has done most in the field of cytological diagnosis of early Ca. of the cervix, namely Dr. J. E. Ayre of Montreal. "A prophet is without honour in his own country" and perhaps I might add "Can any good thing come out of Nazareth?".

Dr. Henderson says "few cases of Ca. would be missed if all patients complaining of vaginal discharge and abnormal vaginal bleeding received a careful pelvic examination with visual inspection of the cervix and biopsy of any suspicious lesion". I heartily agree with this, and would add that if the discharge and bleeding were due to carcinoma of the cervix only too few of these patients would survive. What we must do is diagnose early carcinoma of the cervix *before* there is discharge or bleeding or a suspicious lesion, and the cervical scraping biopsy is one of the best means we have of doing this. And as Dr. Henderson says, "the family physician should make pelvic examination with visual inspection of the cervix . . . an integral part of the general physical exam". But, cervical scraping, with punch biopsy, if indicated, should be the routine. And cervical scraping is available to every one whereas personally I'm not going to do any cervical biopsies in my office. The proponents of cervical scraping have never urged it in place of biopsy and are all agreed that biopsy should be done if (1) any suspicious lesion is

seen; (2) if the cervical smear shows any suspicious cells.

As we have established a cytological "set up" in our small hospital here and have been "screening" smears since January, 1949, I should like to make a few more remarks. I believe that anyone who has had several years of experience in microscopic work could, within a few months, learn to "screen" cervical smears. As far as the time factor is concerned a cervical smear can be examined as easily and as quickly as a smear for tubercle bacilli. We have a flat charge of $3.00 per smear and any that are suspicious are sent to Dr. Ayre's laboratory at no extra charge by us to the patient. Of our first hundred smears 17% were sent. I submit that the smear method is not restricted to a few large centres, also that "10% false negatives may be expected", is an arbitrary high figure. The over 150,000 smears done on 17,000 women at the Royal Victoria Hospital show 93 correctly diagnosed out of 100 early cancers; but they are not quoted. And also I do not agree that carcinoma-in-situ has "an uncertain clinical and pathological status". Cytological aid to the diagnosis of early carcinoma of the uterus is here to stay, make no mistake on that score; why not encourage the profession to make use of it?

St. Stephen, N.B. H. S. EVERETT

SPECIAL CORRESPONDENCE

The London Letter

(From our own correspondent)

PEPTIC ULCER SURVEY

A Medical Research Council report on the peptic ulcer problem provides some useful data on the incidence and distribution of peptic ulcers. The incidence among 4,871 men was 6.5%, whilst among 1,080 women it was 7%. The maximum incidence of 9.6% was attained in men aged 45 to 54. No gastric ulcers were diagnosed under the age of 25. The ratio of gastric to duodenal ulcers was 1:2.2, rising with age and with descent in the social scale. A high incidence was found among doctors (15% instead of the expected 6.9%), business executives and foremen, and a low incidence among agricultural workers. Anxiety over work was complained of more frequently by men with duodenal ulcers than in those with no dyspepsia, but no correlation was found between home worries or irregular meals and the incidence of ulcer. The careful statistical basis of this report places it in a special category; it is certainly the most important survey of the problem that has been published in this country. Although it throws relatively little light on the problem, it does correct some mistaken ideas and should prove a valuable basis for further research.

SMALLPOX

Yet another smallpox outbreak has drawn attention to the dangerously under-vaccinated state of the country. In this outbreak, which is now over, there were 29 cases, and of these 18 had not been vaccinated, nine had been vaccinated in infancy, and two had been vaccinated in infancy and revaccinated since. Of the ten patients who died, seven had never been vaccinated, and three (all over the age of 50) had been vaccinated in infancy only. Of the 18 unvaccinated patients who contracted the disease, 10 were vaccinated within one week of exposure and one of these died; seven were vaccinated more than one week after exposure, and five died; one was not vaccinated at all. Of the nursing and domestic staff of 113 at the isolation hospital where the patients were admitted, 27 had never been vaccinated. Twelve of the staff developed smallpox, and six died. This is perhaps the most disturbing feature of the whole outbreak—that unvaccinated staff should be employed at an isolation hospital to which cases of smallpox are liable to be admitted at any time.

CLEAN FOOD

A report on hygiene in catering establishments, just published by H. M. Stationery Office, recommends the registration of all catering establishments and the enforcement of a "standard" code of hygienic practice. This code is most comprehensive and covers such matters as adequate provision of accessible sanitation conviences and wash basins for the staffs, hot and cold water and adequate lighting. All practicable steps must be taken to prevent, or get rid of, vermin, and all food exposed for sale must be adequately covered. Full details are given of the facilities necessary for washing utensils, which must consist of either an efficient dish-washing machine or at least two sinks each with hot and cold water. Special consideration is given to the washing of glasses in public houses, and it is recommended that the two-sink procedure should be normal for these premises.

The size of the problem is well brought out by the fact that there are 236,000 catering establishments in the country which supply 103 million meals a week. In proportion to this, the number of outbreaks of food poisoning may be small, but they have been increasing steadily since before 1939. It is generally admitted that the standard of hygiene in many catering establishments could scarcely be bettered, but it is in the large number of smaller establishments that the danger lies, and it is these that should benefit from the application of the recommendations of this report.

HOSPITAL COSTS

Some interesting factors concerning hospital costs are contained in a report of the Scottish Department of Health for 1949-50. The expenditure on hospitals in Scotland for this year amounted to £21,933,000, which represents about £4.4s. per head of the population. Each pound of hospital running expenses was made up as follows: For patients 3s. 10d., made up of 2s. for food, 1s. 3d. for drugs, dressings, etc., and 7d. for clothes and laundry. For staff 11s. 10d., made up of 11d. for food, laundry and uniform, 5s. 9d. for salaries for nursing staff, 10d. for administrative staff, 6d. for junior medical staff, and 3s. 10d. for other staff. For buildings and overheads, including fuel, light and power, 4s. 4d.

London, March, 1951. WILLIAM A. R. THOMSON

Among the factors which have confused the issue in nutritional and metabolic experiments in man must be named the superficial or inadequate concept of control and normal. A study of many reports of researches in human nutrition reveals that the controls are oftentimes fragmentary or forgotten. The whole weight of interpretation thus must resolve itself into the most patent empiricism. This coupled with the fact that relatively few clinicians have spent the time and effort necessary to arrive at competence, let alone excellence, in this most difficult medical discipline, helps explain the divergent separation on the spectrum of opinion between the optimists who see vitamin panacea everywhere and the skeptical iconoclasts who deny any virtue at all.—W. B. Bean, *Nutrition Reviews*, **8**: 98, 1950.

on call

published in the interest of community medical service

Plans are Booming. The medical care plans are on the march, with all of them reporting sharp increases in coverage during 1950. Figures gathered by the Canadian Medical Association's Public Relations Committee show that at the end of 1950, 1,552,661 Canadians were receiving medical care through plans sponsored by medical and hospital groups, an increase of 430,900 over the same figure for 1949. This represents a jump of more than 38%.

Enrolment in plans sponsored or approved by medical groups totalled 660,075 at the end of 1950, compared with 467,706 in 1949, an increase of more than 41%.

The greatest percentage increase was reported by Physicians' Services Inc., sponsored by the Ontario Medical Association. With 109,768 subscribers at the end of 1950, P.S.I. registered an increase of 158%.

Pace is Fast. "We find it impossible to keep pace with the demand for P.S.I. coverage," said a plan official. "Last year saw several large industrial groups come in, one comprising more than 20,000 participants. The clerical work involved in providing coverage for a group of this size is immense and our facilities have been under constant pressure through the year. We have had to make it clear to large groups, considering P.S.I. coverage, that we will not be able to accommodate them as quickly as we have in the past."

P.S.I. has recently acquired an additional 6,000 square feet of office space to handle the increased load, but the biggest problem is recruiting office staff. "An ordinary business training is not sufficient for this operation," said a plan official. "We have to train our people from the start unless we are lucky enough to get a girl who has had experience with another plan."

Giant among the plans is the Quebec Hospital Service Association sponsored by the Quebec Hospital Association with an estimated 801,000 members at the end of 1950, an increase in enrolment of 31%.

Public Interest. The public interest in medical care plans was well demonstrated when these figures were released to the press of Canada. Papers throughout the country featured the news. Beyond question the plans are meeting a vital need for citizens.

It would appear that the plans are facing a period of rapid growth which will bring with it severe administrative problems. They are becoming big business and their subscribers might be likened to the shareholders in a big business. Like shareholders, they will be very interested in the soundness and accomplishments of their particular plan. Some plans make a practice of providing copies of their annual report to subscribers. The Public Relations Committee suggests that this practice might well be followed by all the plans.

Attractive annual reports can be inexpensively published in quantity and can do much to stimulate the co-operative attitude among subscribers that is so essential to the successful operation of an undertaking involving the goodwill of the public. By trying to create a sense of participation among subscribers, plan administrators can help ease the headaches that are sure to come with rapid expansion.

Not Only Figures. But it is not necessary, nor desirable, for the plans to confine themselves to cold figures in their annual reports. The value of the plans can be emphasized by stressing their human aspects. For instance, how many babies were delivered under plan coverage in the past year? What about telling, briefly and without names, some of the outstanding cases handled by participating doctors? What about reporting what a company's personnel director says about the plan's effect on absenteeism? (Many report that absenteeism is noticeably reduced.)

Annual reports can also do an educational job among subscribers. One particular aspect of the plan could be discussed, each year, in the report. A description of the routine handling of a call report, for instance, could emphasize the plan's reliance on business machines, and the need for reducing "special case" correspondence. By being shown the difficulty of handling special requests and incorrectly-completed forms, subscribers could be asked to help reduce administrative costs.

Press Information. Besides providing subscribers with annual reports on medical care plans, administrators should consider making reports available to the press. This should be done at the same time that reports are sent to subscribers. Copies should be sent to all newspapers, radio stations and magazines in the area served by the plan. A mimeographed sheet giving the highlights of the report, attached to it, would be helpful to the press. A release date should be clearly specified on this sheet, so that all news sources will have an equal opportunity to use the report. Plan administrators or members of the board of directors should make themselves available on this date to provide any additional information the press might require.

The rapid growth of the plan is encouraging. Doctors have shown that they can take the initiative in providing the medical care security many Canadians obviously want. Of special note is the fact that many large corporations have sought coverage for employees under the plans. These contracts were not signed without long scrutiny by hard-headed business and union leaders, and doctors may be sure, there-

fore, that their plans are economically sound and well-managed.

Increased coverage also makes possible one of the ultimate objectives of the plans—enrolment of individuals on a statistically sound and reasonably-priced basis. If it is possible to enroll any industrial group where 75% coverage is obtained, will it not be possible to enroll individuals in a given community, if 75% of the population is already enrolled through group coverage? Some Canadian plan administrators are giving consideration to this move.

With this rapid growth, plan administrators must also consider another development—the Canadian Medical Association's Statement of Policy that the premiums of people who are unable to pay their own should be paid by the government. It seems that the time has come to consider the practical implications of that complicated problem.

FOR YOU

The Public Relations Committee has available a more detailed summary of the present status of pre-paid medical care plans, which can be had on request through the Toronto office.

Also available for doctors who have speaking engagements to fill are three speeches which can be used as a basis for preparation of material applying to your community.

These are:

Growth of the Plans

Name of medical care plan	*Enrolment Dec. 31/49*	*Enrolment Dec. 31/50*	*Percentage increase*
Medical Services Association. Inc. in British Columbia	140,454	163,608	16.48
Medical Services (Alberta) Inc. Inc. in Alberta ...	23,513	36,353	54.61
Medical Services Saskatoon Inc. Inc. in Saskatchewan	25,090	35,229	40.41
Group Medical Services. Inc. in Saskatchewan ..	9,693 (est.)	11,908 (est.)	22.85
Manitoba Medical Service. Inc. in Manitoba	62,161	87,082	40.09
Associated Medical Services Inc. Inc. in Ontario ...	64,549	85,648	32.69
Physicians' Services Inc. Inc. in Ontario	42,488	109,768	158.35
Windsor Medical Services Inc. Inc. in Ontario ...	76,117	93,893	23.35
Quebec Hospital Service Association. Inc. in Quebec	610,133 (est.)	801,969 (est.)	31.44
Maritime Hospital Service Association. Inc. in N.B., N.S., P.E.I. and Nfld. ..	43,922	90,617	106.31
Maritime Medical Care, Inc. Inc. in Nova Scotia	23,641	36,586	54.76
	1,121,761	1,552,661	Average percentage increase 38.41

1. The Choice is Yours—a speech on health insurance prepared for medical meetings.
2. Health is Your Business—a speech on industrial health for businessmen.
3. Is Your Community Healthy?—a speech on community health for service clubs and similar organizations.

en devoir

Publié par l'Association médicale canadienne dans l'intérêt des soins médicaux en commun

Ca augmente partout. Les organisations d'assurance-santé prennent de plus en plus d'ampleur et elles rapportent toutes une augmentation considérable d'assurés au cours de 1951. Les chiffres compilés par le comité des relations extérieures de l'Association Médicale Canadienne révèlent qu'à la fin de 1950, 1,552,661 Canadiens recevaient des soins médicaux par l'entremise d'organisations patronnées par des médecins ou des hôpitaux; c'est une augmentation de 430,900 par rapport à 1949, soit 38%.

La participation à des organisations patronnées ou endossées par des groupements médicaux s'élevait à 660,075 à la fin de 1950, soit une augmentation de plus de 41% par rapport à 467,706 qu'elle était en 1949.

Le plus fort pourcentage d'augmentation est accusé par "Physicians' Services Inc." patronnée par l'Association Médicale d'Ontario. 109,768 assurés à la fin de 1950 donnent à PSI une augmentation de 158%.

Le rythme est accéléré. Selon un directeur de l'organisation "il nous est impossible de répondre à la demande de tous ceux qui veulent appartenir à PSI. L'an dernier plusieurs groupes industriels ont demandé leur admission et l'un de ceux-là comprenait plus de 20,000 assurés à lui seul. Le travail de bureau que nécessite l'assurance d'un groupe aussi nombreux est gigantesque et nos ressources ont été poussées à la limite toute l'année. Il nous a fallu expliquer à certains groupes, anxieux d'adhérer à PSI, que nous ne pourrons les accepter qu'après un certain délai plus long que dans le passé."

PSI s'est récemment procuré 6,000 pieds d'espace de bureau additionnel pour faire face à l'augmentation mais le problème d'embaucher du personnel est plus aigu. "L'expérience d'affaires ne suffit généralement pas pour notre genre de travail" déclare un directeur de l'organisation. "Nous devons donner tout un entraînement à notre personnel, sauf lorsque nous avons le veine de recruter une jeune fille qui nous vient d'une organisation du même genre que la nôtre."

L'une des organisations les plus imposantes est l'association d'hospitalisation du Québec, patronnée par l'association des hôpitaux du

Québec, qui recrutait 801,000 membres à la fin de 1950, soit une augmentation de 31%.

Le public est intéressé. L'intérêt que porte le public aux projets d'assurance-santé n'a jamais été plus évident que lorsque ces chiffres ont été communiques aux journaux du pays. Partout dans la presse on leur a fait une place importante. Il ne fait pas de doute que l'assurance-santé répond à un besoin vital de la population.

Les associations doivent s'attendre à une expansion rapide qui leur créera des problèmes administratifs sérieux. Elles deviennent de grosses entreprises et leurs assurés se compareront un peu aux actionnaires d'une grosse entreprise. Tout comme les actionnaires ils seront intéressés à l'efficacité et aux résultats donnés par leur association. Quelques associations ont pris l'habitude de communiquer des copies de leur rapport annuel à leurs assurés; c'est une habitude que notre comité de relations extérieures conseille à toutes les associations d'adopter.

Des rapports annuels bien présentés ne coûtent pas cher à imprimer en quantité et ils contribuent à stimuler l'idée de coopération entre les assurés, chose essentielle au succès. En développant le sens de la responsabilité chez leurs assurés, les administrateurs dissiperont quelques-uns des malaises qui accompagneront la croissance rapide de leur organisation.

Pas rien que des chiffres. Il n'est pas nécessaire, ni même recommandable, que les associations s'en tiennent strictement à des chiffres dans leurs rapports annuels. L'utilité d'une association s'illustre tout aussi bien par des faits de la vie quotidienne. Ainsi l'on peut souligner le nombre de naissances auxquelles l'assurance a pourvu pendant l'année précédente—l'on peut discuter brièvement, et sans faire mention des noms, de quelques-uns des cas les plus intéressants traités par des médecins qui participent à l'association. L'on peut encore mentionner l'opinion du gérant du personnel d'une compagnie sur la réduction des absences au travail chez les assurés. (Bon nombre avisent que cette réduction est sensible.)

Le rapport annuel peut encore faire un travail éducatif chez les assurés. Chaque année l'on peut traiter d'un aspect de l'assurance en particulier. Ainsi la description du travail qu'entraîne le rapport d'une visite peut servir à souligner le rôle que joue le classement mécanique pour le bon fonctionnement de l'organisation; du même coup, l'on fera sentir l'importance de réduire la correspondance des "cas spéciaux" au plus strict minimum. L'on sollicitera le concours des assurés pour diminuer les frais administratifs en leur faisant réaliser ce que les demandes spéciales ou les formules mal remplies causent d'embarras.

Des renseignements à la presse. Non seulement les administrateurs pourraient-ils fournir un rapport annuel à leurs assurés; ils devraient encore songer à communiquer ce rapport aux journaux. Ceci se ferait en même temps que l'expédition du rapport aux assurés. Des exemplaires devraient être envoyés à tous les journaux, les postes de radio et le revues qui rayonnent dans le territoire desservi par l'association. Il serait utile d'attacher au rapport un feuillet miméographié ou l'on en souligne les points les plus importants. Ce feuillet devrait porter une date de publication bien déterminée afin que tous les usagers de la nouvelle y aient accès en même temps. Ce jour-là les administrateurs ou les directeurs de l'organisation devraient être disponibles pour répondre aux demandes de renseignements des journaux.

La croissance rapide des organisations est fort encourageante. Les médecins ont prouvé qu'ils possèdent l'initiative voulue pour fournir l'assurance de soins médicaux au grand nombre de Canadiens qui y aspirent évidemment. Et la quantité de compagnies importantes qui ont cherché à assurer leurs employés est notable. Il n'y a pas eu de signature de contrat sans examen sérieux de la part des hommes d'affaires et des chefs ouvriers intéressés et les médecins peuvent en tirer la conclusion que leur plan d'assurance est solide et bien administré.

A mesure que le nombre des assurés augmente, il est un des objectifs de l'assurance-santé qui devient de plus en plus réalisable: la participation des individus moyennant un coût raisonnable établi selon des statistiques. Si c'est possible d'accepter l'adhésion d'un groupement industriel à raison d'une participation à 75%, ne serait-il pas possible de recruter les citoyens de n'importe quelle localité si 75% de la population est déjà assurée comme partie

Le tableau des augmentations

Nom de l'organisation d'assurance-santé	*Assurés 31 déc. 1949*	*Assurés 31 déc. 1950*	*% de l'augmentation*
Medical Services Association, Colombie-Britannique	140,454	163,608	16.48
Medical Services (Alberta) Inc.	23,513	36,353	54.61
Medical Services Saskatoon Inc.	25,090	35,229	40.41
Group Medical Services, Régina	9,693 (est.)	11,908 (est.)	22.85
Manitoba Medical Service	62,161	87,082	40.09
Associated Medical Services Inc., Ontario	64,549	85,648	32.69
Physicians' Services Inc., Ontario	42,488	109,768	158.35
Windsor Medical Services Inc.	76,117	93,893	23.35
Association d'Hospitalisation du Québec	610,133 (est.)	801,969 (est.)	31.44
Maritime Hospital Service Association	43,922	90,617	106.31
Maritime Medical Care, Inc.	23,641	36,586	54.76
	Nombre total d'assurés 31 déc. 1949	Nombre total d'assurés 31 déc. 1950	Moyenne de l'augmentation en %
	1,121,761	1,552,661	38.41

d'un groupement. Certains administrateurs d'organisations canadiennes y songent.

L'expansion rapide force les administrateurs d'organisations d'assurance-santé à envisager autre chose: la déclaration de principes de L'Association Médicale Canadienne à l'effet que le gouvernement devrait payer la prime de ceux qui en sont incapables. Il est probablement temps d'étudier le côté practique de ce problème compliqué.

Le comité des relations extérieures tient à votre disposition un état plus détaillé de la situation actuelle des organisations de soins médicaux payés par anticipation; on peut se le procurer sur demande au bureau de Toronto.

L'on tient aussi à la disposition des médecins qui ont des discours à faire trois textes qui peuvent servir de canevas pour la préparation de causeries appropriées à son auditoire.

Ces textes s'intitulent:

1. The Choice is Yours—un texte sur l'assurance-santé à l'usage de réunions de médecins.

2. Health is Your Business—un texte pour causerie à des hommes d'affaires, sur la santé dans l'industrie.

3. Is Your Community Healthy?—un texte sur la santé publique pour causerie devant clubs ou groupes.

NEWS ITEMS

News of the Medical Services

Canadian Armed Forces

Surgeon Captain A. McCallum, Medical Director General, Royal Canadian Navy, visited Naval units on the West Coast during the month of February.

A series of five lectures on Military Psychiatry was inaugurated at Queen Mary Road Veterans' Hospital, Montreal, under the general supervision of Dr. T. E. Dancey. These lectures were open to medical officers of the three armed forces, active and reserve, and to interested civilians. The final lecture by Dr. James Tyhurst on the subject of "Psychiatric Aspects of Civil Defence", held on February 19, was extremely interesting and well attended. It is expected that the content of this series of lectures will be edited and made available to all medical officers at a later date.

Colonel J. N. Crawford, M.B.E., E.D., R.C.A.M.C., Senior Consultant in the Directorate of Medical Services (Army) addressed the Graduate School, Army Medical Centre, Washington, D.C., on February 16, on the subject "The PULHEMS system of manpower classification and its application in the Canadian Army".

The first annual conference of Senior Medical Officers and of Medical Secretarial Officers of the R.C.A.F. was held in Ottawa February 19 to 24, 1951. The Chairman of the meeting was Group Captain A. A. G. Corbet, Director of Health Services, R.C.A.F. The agenda covered all items of medical interest which related to the current and future R.C.A.F. plans. Detailed recommendations for implementation were made on all medical kits, particularly those relating to aircraft use. Every advantage was taken of standardizing items where these could be made of common use to the three Services.

Three more R.C.A.F. Nursing Sisters, Flying Officer M. J. Fitzgerald, Flying Officer I. E. Zeigler and Flying Officer V. J. Drummond, have successfully passed a course in air evacuation at the School of Aviation Medicine, Randolph Field, Texas, and are finishing the required three months' practical flying connected with air evacuation work. Two more Nursing Sisters, Flight Lieutenant D. L. Thomson and Flight Lieutenant V. M. Deneau, have been posted to the next training course.

Squadron Leader H. B. Hay, D.S.O., D.F.C. and Bar, has successfully completed a conversion course to jet aircraft and has resumed his regular posting as Officer Commanding, School of Aviation Medicine, Institute of Aviation Medicine, Toronto. Squadron Leader Hay was one of the outstanding bomber pilots of the R.C.A.F. during the war, after which he returned to Medical College to obtain his degree in Medicine.

Alberta

The Surgical Society of Western Canada held its annual meeting in Winnipeg. A fine program was arranged by the Winnipeg members. The members then travelled to Minneapolis for the conclusion of the meeting, where a well arranged session was carried out by the surgical staff of the University of Minnesota.

Dr. Harold Richards has completed a surgical tour of the Eastern United States and is back in Edmonton where he carries on his surgical practice.

The new unit for the pathological department of the University of Alberta has been opened and is a fine addition to the rapidly expanding institution. It is situated just west of the University hospital.

Dr. and Mrs. R. E. Jesperson are spending the mid-winter month in Honolulu. Travel by air from Edmonton takes but a short time.

The medical students of the University of Alberta held their annual "Med-Night" at the University. A very fine program was put on and the "talent" was able to keep the full-house in stitches during the two nights it was held. Many of the faculty members were excellently "represented"—on the stage.

Dr. Robert R. Francis has commenced practice in Urology in Edmonton. Dr. Francis is a Fellow of the Royal College of Surgeons of Canada. He is a graduate of the University of Alberta. W. C. WHITESIDE

British Columbia

By far the most important medical problem in British Columbia is that presented by the Hospital Insurance situation. This has flared into public interest lately, owing to several factors. The first is the undoubted and growing shortage of beds in the major hospitals, especially in Vancouver, where the situation is quite acute. The second is the growing cost of the scheme, which not only leads to deficits and treasury protests, but militates against further building of beds.

The third factor is the growing dissatisfaction of the public, which rises partly out of the above causes, and partly from natural objections to compulsory payment of the tax. This is a pity, because there can be no doubt that the scheme is an excellent one, of great benefit to the public, and capable of even further improvement in these regards. The only serious difficulty in its way is financial, and while this is very trying, it can and so must be met.

The whole matter is being thoroughly aired in the Legislature which is now in session. The press has taken an active part in the fight, and while it does so with some reservations it appears to be, on the whole, on the side of the medical profession and the public.

Dr. A. W. Bagnall of Vancouver, speaking to the annual meeting of the B.C. division of the Canadian Arthritis and Rheumatism Society, brought out some interesting points: especially with regard to the use of cortisone. If this were given to all the arthritics in the province, he said, the cost of adequate maintenance for a year could easily reach $15,000,000.00. Research being carried on by Dr. Robert Kerr, Professor of Medicine at the University of British Columbia, he stated, was on a much larger scale than anything yet undertaken regionally in Canada. A campaign for $150,000.00 is contemplated in the near future.

The Fraser Valley Medical Society has lately taken over the Ladysmith Medical Services Association, and the united body will operate continuously without interruption of the work of either one.

The Sisters of St. Ann recently celebrated the twenty-fifth anniversary of their administration of Lourdes Hospital at Campbell River, which was erected in 1914 on property given by the late Charles Thulin, a well-known figure in Coast history. It was closed in 1924, owing to lack of funds and was reopened in 1926 by the Sisters of St. Ann. This hospital has grown steadily in efficiency and service to the growing community of Campbell River. It has 46 beds, and efforts are being made to increase its size, as it is rapidly becoming too small for the needs of the district.

Scarlet fever has attained mildly epidemic dimensions in Vancouver lately, some 245 cases having appeared in about six weeks. It has been of a comparatively mild nature and easily controlled.

Dr. Cecil E. Robinson, M.D., C.M., F.R.C.P., has been appointed medical director of the B.C. Division of the Canadian Arthritis and Rheumatic Society. He will supervise all clinics and medical centres of this Society in British Columbia.

The Nanaimo Red Cross is conducting a one-night campaign to raise $5,000.00 for the work of the Society in Nanaimo. Mr. Dean Finlayson is in charge of the drive. J. H. MACDERMOT

Manitoba

St. Boniface Health Department has issued a booklet "Ten Years of Service". This covers the period during which Dr. Paul L'Heureux has been director of the St. Boniface Health Unit. It is a record of outstanding service. At the request of Hon. Paul Martin, minister of national health and welfare, Dr. L'Heureux will leave on February 5 for Victoria, B.C. where he will be a consultant on Wetzel grids, charts which enable the health of school children to be checked twice a year by the health officer.

Hon. Ivan Schultz, Minister of Health, addressed the General Practitioners Association of Manitoba in the Medical College on February 21. He pointed out that in a totalitarian state the doctors were the first to lose their liberties while in a democratic state personal rights were recognized. He noted that Manitoba already had a prepaid medical scheme. At present this does not take in indigents, and to ensure that they could receive the benefits of the scheme the government might have to contribute the cost of their care.

The Children's Hospital of Winnipeg was host to the members of the Winnipeg Medical Society on February 16. Exhibits and demonstrations by members of the attending staff aroused the keen interest of the many doctors present.

Mr. A. Clements, statistician of the prepaid Michigan Medical Scheme, came to Winnipeg to look over the working of the Manitoba Medical Service. On the evening of February 20 he spoke to a gathering of the medical shareholders on his experience with the Michigan scheme and answered many questions put to him. Dr. C. E. Corrigan moved the vote of thanks.

Dr. S. E. Bjornson of Miniota has been honoured with life membership in the College of Physicians and Surgeons of Manitoba. Born in Iceland in 1885 he came to Canada in 1908 and graduated with honours in medicine eight years later. He has practised medicine in Gimli, Arborg, Ashern, Oak River and Miniota. A volume of his poetry was published in 1945 and he has twice held the Canadian correspondence championship in chess.

Dr. R. M. Jackson, who graduated from Manitoba Medical College in 1944 has been awarded the F.R.C.S. Edinburgh degree.

One of the guests at the reunion and banquet of the 10th Canadian Field Ambulance Association on February 24 was Major H. W. Wadge, (R) R.C.A.M.C., who was with the unit when it was mobilized in 1915.

Ten thousand dollars in federal grants has recently been approved for new tuberculosis control projects in Manitoba under the national health program.
ROSS MITCHELL

New Brunswick

Dr. Norman Skinner of Saint John has returned from attending a course of cardiological study at Bellevue Hospital, New York.

Dr. C. H. Turner and Dr. R. H. Baird, of Fredericton, will shortly attend clinics and lectures at the Memorial Hospital, New York, a part of the cancer education program of the N.B. Division of the Canadian Cancer Society.

Dr. R. A. H. MacKeen, Director of N.B. Provincial Laboratories, addressed the Saint John Medical Society at their regular February meeting. He discussed the "use and abuse of Laboratory Methods".

The minister of health, Dr. F. A. McGrand, announced the opening of the Eighth Provincial Tuberculosis Diagnostic Clinic at Woodstock. Dr. J. R. Allanach will be the physician in charge. A. S. KIRKLAND

Nova Scotia

Influenza swept through Nova Scotia during February like a southeast gale, missing few, causing much discomfort but doing little serious damage. Perhaps greatest sufferers as a group were the medical men, particularly those in the country districts who worked eighteen and twenty hour days for weeks on end, often nurturing the same virus in their own breasts. Hardy Nova Scotian stock and the use of antibiotics, prophylactically and at the first sign of complications in the disease, were put down as the two main reasons for the very low mortality. How Maritime Medical Care Inc. fared with its first big epidemic will be unknown for another month but prudent business-like physicians are getting their bills in early before the prorated Maritime Medical Care dollar is forced to a new low.

Dr. B. Charles Sullivan with his two assistants, Dr. Gordon S. Harris and Dr. Lloyd Hirtle, had Canada's biggest and most ideal practice in 1950; biggest because 110,561 crew members and ship's passengers were passed by them as physically fit in their posts as Halifax port physicians; most ideal because their work was prophylactic. The treatment of disease was definitely secondary, a mere 10,000 seeking their professional advice.

Nova Scotia's many small hospitals tabled their annual reports last month with deficits being almost universal. New Waterford General Hospital and the Highland View of Amherst proudly showed a surplus.

Dr. H. B. Atlee, Dalhousie's Professor of Obstetrics and Gynæcology, in a public meeting, announced that a new maternity hospital for Halifax was in greater need than the long proposed, perhaps soon-to-be-realized, Halifax Harbour bridge. No doubt Dr. Atlee believes that while one spans a most important body of water the other spans an eternity.

Work has already begun on the new 185 bed Saint Rita's Hospital in Sydney being rushed to replace the old hospital destroyed by fire two months ago. With probably fewer hospital beds per capita than any other part of Nova Scotia the need for the new building was made much more acute by the loss of the old.

Nova Scotia Quarry Workers Union presented a one thousand dollar cheque to aid in the construction of the new wing of their Payzant Memorial Hospital at Windsor.

ARTHUR L. MURPHY

Ontario

The eighth Banting Memorial Lecture was delivered on February 21, the tenth anniversary of Banting's death, at Convocation Hall, by Dr. F. D. W. Lukens, associate professor of medicine, University of Pennsylvania and director of the George S. Cox Medical Research Institute. His subject was "Studies on the Pathogenesis of Diabetes". On the same afternoon the bust of Banting by Frances Loring was unveiled at Simcoe Hall by Professor C. H. Best in a ceremony presided over by President Sydney Smith in the presence of Lady Banting, members of the University Faculty and Banting's colleagues in the Faculty of Medicine.

The National Conference on the Rehabilitation of Disabled Persons was held in Toronto for three days in February. It was to have been held in Winnipeg in May but the floods interfered. The Conference was sponsored by the federal departments of Labour, Veterans' Affairs, and Welfare. About 150 delegates attended, representing the federal departments concerned, the ten provincial governments, the voluntary agencies concerned with rehabilitation and employer and

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Montreal, June 18 to 22, 1951

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employee organizations, together with experts in different aspects of rehabilitation work. Federal Health Minister Martin in discussing the extent of the problem said there might be 9,000 Canadians with some form of permanent or extended disability. In 1949 more than 325,000 disabled persons received assistance under different programs. Total cost was about $110,000,000.

H. C. Hudson, chief of the special placement branch, National Employment Service, told the conference that his branch had made 10,970 placements of handicapped persons in 1950. Col. A. E. Baker, national director of C.N.I.B., reported that 1,700 blind persons had been placed in industry and received an annual payroll of $2,500,000.

Veterans' Affairs Minister Lapointe said that D.V.A. has 37,500 veterans registered with casualty rehabilitations. Nearly 28,000 are steadily employed, although 4,000 of them are still under treatment. Of 16,000 veterans receiving pensions of 80% or more, less than 10% are not employed.

Dr. W. P. Warner, Director of Treatment Services of D.V.A., said that in any medical rehabilitation plan the doctor is the keystone of the program. There is a need in all general hospitals for a few beds set aside specifically for the rehabilitation of selected patients. The total rehabilitation set-up would be a doctor, a physiotherapist, a social worker and a placement officer. There is need for rehabilitation centres in large communities where adequate follow up care can be given. They need not be elaborate but should have a doctor educated toward rehabilitation. This would preferably be a person trained in physical medicine, but they are scarce so an internist would be the next choice. Any comprehensive rehabilitation program should closely ally itself with a university from which it will draw skilled and trained personnel. Medical consultants from the universities could be brought into such a program on a part time fee basis such as applies to the D.V.A.

Premier Frost said that it had been estimated in the United States that the cost of rehabilitating a handicapped person is about equal to maintaining that person for one year as a public charge.

The Phi Delta Spsilon Fraternity Lecture was given by Dr. William Dameshek of Boston on "Chemotherapy of Leukæmia and Leukosarcoma". With the use of chemotherapy life seems to be prolonged about two years in these diseases. New chemicals are constantly being tried. He showed pictures of children with leukæmia who had been treated by ACTH. They had a fat, porcine appearance and eventually succumbed.

Dr. H. B. Van Wyck has been made a life member of the Hamilton Academy of Medicine. Dr. Van Wyck is a happy example of a doctor who is making a success of retirement. He gives some special lectures in the History of Medicine to the students. His oil paintings were recently exhibited in a group of hobby painters at Eaton's Art Gallery, he has become a member of the Mendelssohn Choir. When he decided to take a trip South he engaged a tutor in Spanish for an hour and a half daily and mastered the language before his departure.

Health Minister Phillips has told the legislature that mental health is one of the most serious problems in Ontario. Five cents of every dollar of gross provincial revenue goes to mental health; one person out of every 22 in Ontario will become a mental patient; 27% of all Ontario civil servants are engaged in the mental services; 4 out of every 1,000 population are patients at present; the average total of mental patients exceeds the total of patients in every general, convalescent and incurable hospital in Ontario.

Last year more than $15,000,000 was spent on these patients. The major requirement today, said Mr. Phillips, is a research department devoted exclusively to the training of staff, seeking causes of mental illness and developing treatment and cure. Such a research plan is to be started soon. Four travelling clinics, each made up of a psychiatrist, a psychologist, a social worker and their staffs are now in operation in the province.

When an indigent patient from a mental hospital requires special medical or surgical treatment, available only in a public hospital, the province has paid for such care on the same basis as a municipality pays for all other indigent cases, that is, at the rate of $4 a day. But often heavy expenses are incurred in the cost of drugs and x-rays. A new bill has been passed so that the province will now pay actual out-of-pocket expenses of the hospital for these people.

Professor C. H. Best has been awarded a grant of $5,000 by the Nutrition Foundation Incorporated to continue research into protective and curative effects of lipotropic agents. The Foundation has renewed a grant to Dr. Erich Baer of the Banting and Best department of medical research for work on lipid substances.

The Kitchener-Waterloo Academy of Medicine recently received its charter from the Ontario Government, making it the fifth community in the province to be incorporated as an academy. Dr. L. V. Lang is the first president and Dr. A. V. Traynor is the secretary.

A two million dollar Institute of Radiotherapy, to provide every known facility for diagnosis and treatment of cancer and for research into cancer prevention and cure has been announced by Premier Frost. The new centre will be erected at Wellesley Hospital. Throughout Ontario and stemming from this major centre, treatment centres in Windsor, London, Hamilton, Kingston, Ottawa, the Lakehead and other northern Ontario points will be operated involving a further outlay of about $500,000.

Work will be launched quickly on the new buildings. First there will be a clinical centre; this building will be constructed to accommodate modern equipment, including the latest supervoltage x-ray therapy machines and a radioactive cobalt bomb. It will include facilities for isotope therapy, as well as standard therapeutic equipment. Space will be adequate for experimental research. It will contain administrative offices, examining rooms, lecture and instruction rooms, out-patient clinics for follow up examinations, also laboratories. The plan includes the construction of a nurses' residence. This will be designed to accommodate the nurses of Wellesley Hospital as well as those working in the Institute of Radiotherapy.

The direction of the Institute will be undertaken by the Ontario Cancer and Research Foundation but the management and treatment will be in the hands of the medical staff of the Toronto General Hospital in conjunction with the medical faculty of the University of Toronto. Specialists from other Toronto hospitals will be included on the Institute medical staff and cancer treatment generally will be closely integrated with that of all Toronto hospitals. The undertaking has the full co-operation of the federal government. It is anticipated that federal grants to the full limits of its program will be provided for this cause. LILLIAN A. CHASE

Quebec

The Royal Victoria Hospital, Montreal, will open a drive for $7,000,000.00 on June 1. The object is to provide for the modernization of the hospital, now 57 years old, and the addition of 277 new public and semi-private beds. The Royal Victoria did not take part in the Joint Hospital Fund organization last year, since its own plans were still under study. The chairman of the drive, Mr. Harold Crabtree, has emphasized the urgent need for bringing the hospital facilities up to date. For example, the same kitchen that in 1894 prepared only 588 meals a day is now handling 4,300 meals a day, and in many other details the hospital needs modernization.

It is also planned to add a new wing to the Allan Memorial Institute.

Lors de l'assemblée annuelle de *l'Union Médicale du Canada,* il y eut élection des officiers pour l'année courante. Le Dr Léon Gérin-Lajoie en a été élu président, le Dr Pierre Smith, vice-président, et le Dr J. A. Vidal, secrétaire-trésorier avec comme assistant le Dr Paul René Archamnault. A la rédaction, les Drs Roma Amyot et Edouard Desjardins ont été réélus, le premier, rédacteur-en-chef et, le second, assistant rédacteur-en-chef. Le Dr Roger Dufresne a été désigné comme secrétaire de la rédaction.

Un nouvel hôpital est à l'état de projet. Il serait érigé à Granby et contiendrait 200 lits au service exclusif des malades incurables et des invalides.

Le Foyer Dieppe de St-Hilaire pour épileptiques, qui hospitalise 70 malades âgés de 15 à 55 ans, recevra une subvention fédérale qui pourvoira aux traitements de deux nouvelles infirmières et de deux thérapeutes professionnels.

On vient d'établir un Centre de recherches canadien d'influenza au Laboratoire d'Hygiène du ministère fédéral de la Santé. Parmi les membres qui feront partie de ce Centre se trouve le Dr Armand Frappier, directeur de l'Institut d'Hygiène et de Microbiologie de l'Université de Montréal.

En vertu du plan fédéral d'aide à la construction des hôpitaux, on procède actuellement à l'agrandissement de deux hôpitaux à Montréal. L'Hôtel-Dieu construit une aile de neuf étages où pourront être hospitalisés 210 malades atteints de rhumatisme. L'Hôpital des Convalescents, avenue Kent, agrandit son cinquième étage pour pouvoir installer 40 lits de plus.

Saskatchewan

In May of last year, the Premier, Mr. Douglas, speaking at the opening of the Medical Building, University of Saskatchewan, announced that his government had authorized the completion of the hospital as originally planned. Since then construction has gone ahead rapidly and it is understood that the appointment of a Medical Superintendent will soon come up for consideration.

Wing "G" which connects the medical school to the main stem is closed in so that the plumbers and electricians have been able to work through the winter. The steel for "C" and "F" is up and the stone masons will go ahead with them as soon as the weather permits. In the other sections the foundations and footings are almost complete and the steel is being fabricated. Rapid progress therefore is to be expected during the coming spring and summer. With the present uncertainty as to the supply of materials it is difficult to predict when the hospital will be open for the reception of patients but if no serious delay occurs the fall of 1953 would appear reasonable.

The Central Health Services Committee met in Regina on Sunday, February 25, with an excellent representation of physicians from all corners of the province. Twenty-seven members were present. A report was received from Dr. D. E. Rodger concerning the activities of the Canadian Arthritis and Rheumatism Society, Saskatchewan Division, and the information that a medical director for this program is now to be engaged. The program was approved by the members present and Dr. Rodger given encouragement to continue. A report of recent meetings with government was presented and the opinion of the members solicited for the guidance of Council. Further steps were taken to bring about more complete understanding on prepaid medical care problems as they exist in the province and to find ways and means of promoting the voluntary system. Some concern was expressed about the manner in which a great number of medical lay societies were developing without relation one to the other and without any control and guidance. More thought will be given to this problem to try to ensure that they will develop in orderly fashion and really accomplish the desired purpose.

The Saskatoon Nursing Home containing accommodation for 100 elderly patients was officially opened on Saturday, March 3. The purpose of this home is to accommodate elderly patients who do not require active hospital treatment and constant medical care. Many of these persons were occupying beds in active treatment hospitals since there was previously no satisfactory accommodation for them outside the hospital.

During the past month the Cabri Union Hospital has increased its bed capacity to seventeen with an extension to the second floor of the hospital. The Gainsborough Union Hospital re-opened with a rated bed capacity of eleven beds.

Dr. R. G. Murray of Saskatoon is taking a three year postgraduate course in ophthalmology and otolaryngology at Sunnybrook Hospital in Toronto.

Dr. W. D. Frew recently returned to the Medical Arts Clinic in Regina to resume practice after a year of postgraduate studies.

G. G. FERGUSON

General

The First International Congress on Diseases of the Chest sponsored by the Council on International Affairs, American College of Chest Physicians, held at the Carlo Forlanini Institute, Rome, Italy, September 17 to 22, 1950, was attended by approximately 1,000 physicians and their wives. At the inaugural session the College Medal was presented to Sir Alexander Fleming, London, England, for his discovery of penicillin.

More than 100 scientific papers were presented during the congress by physicians from 40 countries. Every aspect of diseases of the chest was presented including the latest advances in antibiotic and chemotherapy treatment of chest conditions, thoracic surgery concerning itself with pneumonectomies and lobectomies for carcinoma and tuberculosis, cardiovascular surgery as well as thoracoplasty, extrapleural pnemothorax, and other surgical procedures. Papers were presented by two delegates from the Soviet Union. Professor Pavel Lukomski, of Moscow, read a paper entitled "Etiopathogenesis of Suppurative Diseases of the Lung"; Professor Feodor Uglov read a paper entitled "Lung Resection Ligation of the Pulmonary Artery in the Treatment of Chronic Suppurative Lung Diseases". A third paper by Professor A. N. Bakoulew on the use of blood transfusion in thoracic surgery was also presented by the Russian delegation.

Special administrative meetings of the Governors and Regents of the College from the 40 countries represented at the congress were held. Dr. Chevalier L. Jackson, Philadelphia, chairman of the Council on International Affairs, presided at these meetings. A European Chapter of the College was organized with Dr. Andre Meyer, Paris, as the general secretary.

The delegate from Canada who attended the Congress in Rome was Dr. Charles Henry Dorval. The Congress was honoured by the presence of Professor Ludolph A. Brauer, Muchen, Germany, who is credited with having done the first thoracoplasty. Professor Brauer is 86 years of age and is an honorary Fellow of the American College of Chest Physicians.

The delegates were received by his holiness, Pope Pius XII and a reception was held for the visiting delegates by Salvatore Rebecchini, mayor of Rome; and receptions were given by ambassadors from many other countries. The meeting closed with an attendance of 750 at the grand ball and reception at the Hotel Excelsior, Rome, Italy.

The International Congress of Psychiatry was held in Paris from September 18 to 27, 1950. Almost 2,000 members from 46 countries attended. During those eight days, 75 work sessions were held (plenary sessions, colloquies, symposia) bearing upon the overall problems

of present day psychiatry. The Proceedings of the Congress will be published in eight volumes which will be issued during 1951.

The assembly of representatives of 39 psychiatric societies from 26 countries (an assembly which constitutes from now on the legal basis of World Congresses of Psychiatry) has decided upon the organization of periodic congresses at which representation from all countries of the world will be invited. Meetings will be held at intervals of approximately 5 years. It was unanimously resolved that the International Congress of Psychiatry would officially bear the title of World Congress of Psychiatry.

Until the Organization Committee of the next Congress has been selected, any correspondence may be directed to the Secretariat of World Congresses of Psychiatry, Centre Psychiatrique Ste-Anne, 1, rue Cabanis, Paris (XIVe).

The International Congress of Clinical Pathology will be held in London, England, July 16 to 20, 1951. The Congress is open to all those interested in the subject, on payment of the registration fee. Inquiries to be addressed to Dr. W. H. McMenemy, Maida Vale Hospital for Nervous Diseases, London, W.9.

The American Congress of Physical Medicine will hold its twenty-ninth annual scientific and clinical session September 4, 5, 6, 7 and 8, 1951 inclusive, at the Shirley-Savoy Hotel, Denver, Colorado. Scientific and clinical sessions will be given on the days of September 4, 5, 6, 7 and 8, 1951. All sessions will be open to physicians and other professional personnel. In addition to the scientific sessions, the annual instruction seminars will be held September 4, 5, 6, and 7. These seminars will be offered in two groups. One set of ten lectures will consist of basic subjects and attendance will be limited to physicians. One set of ten lectures will be more general in character and will be open to physicians as well as to therapists, who are registered with the American Registry of Physical Therapists or the American Occupational Therapy Association. Full information may be obtained by writing to the American Congress of Physical Medicine, 30 North Michigan Avenue, Chicago 2, Illinois.

The Eighth Annual Meeting of the **American Psychosomatic Society** will take place at Chalfonte-Haddon Hall, Atlantic City, New Jersey. The date of the meeting is April 28, 1951. Since the one-day meeting held last year met with unusual enthusiasm and participation, the council of the society has agreed to hold a one-day meeting again this year. Should further information be desired, please communicate with the society office, at 714 Madison Ave., New York 21, N.Y.

The International Academy of Proctology will present its first teaching seminar on proctologic subjects, including the more recent developments, in the form of a symposium and round-table discussion. The session will be held in New York City, April 7, 1951. Registration for the seminar will be limited in number and open to licensed physicians who are members of the American Medical Association; state or county medical associations and graduates of an approved medical school. Admission to the seminar will be by card only. For further information communicate with Dr. William Lieberman, Chairman, Seminar Committee, International Academy of Proctology, 1819 Broadway, New York 23, N.Y.

The Government of Brazil is extending an invitation to all Canadian neurosurgeons to attend the Fourth South American Congress of Neurosurgery, which will be held at Porto Elegre, on April 22, 1951, under the chairmanship of Professor Elisen Paglioli. Inquiries should be addressed to Professor Paglioli, at the Medical Faculty of Porto Elegre, Rio Grande do Sul, Brazil.

The Fifth Annual Amputee Conference will be held in West Orange, N.J., April 5, 6, and 7, 1951, at the Kessler Institute for Rehabilitation. Inquiries may be addressed to the Institute.

The Michael Reese Hospital Postgraduate School will be offering a one-week course in "Recent Advances in Pædiatrics—Diagnostic and Therapeutic Measures". This full-time intensive course will meet from May 21 to May 26, 1951. Clinical and didactic material will be presented by Members of the Department of Pædiatrics and Co-operating Departments. For further information, address the Dean, 29th St. and Ellis Ave., Chicago 16, Illinois.

The American College of Physicians is holding a postgraduate course on "Diseases Due to Allergic and Immune Mechanisms" on April 24 to 28, 1951. This course was first given in Atlantic City in 1949, and was extremely successful. It is now being given at Pittsburgh, Pennsylvania, on the dates given. It is expected that there will be a good registration. The fees are: A.C.P. members, $30.00; non-members, $60.00. The Director is Dr. L. H. Criep and all registrations are handled through the A.C.P., 4200 Pine Street, Philadelphia 4, Pa.

The World Health Organization has compiled and published a list of vaccinations required by 122 countries and territories from travelers coming from abroad. The list indicates the situation as on December 31, 1950. Copies of this list will be made available, on request, to national health administration, port and airport health authorities, steamship navigation companies and airlines, and their agents.

The World Health Organization states that there is no provision in the International Sanitary Conventions making it compulsory for travelers to be vaccinated or inoculated against the diseases dealt with. However, for some years past it has been customary for sanitary administrations to request travelers coming from infected, suspected, or even healthy areas to present on arrival in the country certificates of inoculation or vaccination against one or more of these diseases: cholera, yellow fever, typhus, and smallpox.

A reminder of the period of validity of certificates of vaccination or inoculation, as laid down in the 1944 International Sanitary Convention, is also included. Reckoned from the date of immunization, it is: for smallpox, 14 days to 3 years; for cholera, 7 days to 6 months; for yellow fever, 10 days to 4 years; for typhus, 1 year.

The 1951 meeting of the American Goitre Association, will be held in the Deshler-Wallick Hotel, Columbus, Ohio, May 24, 25, and 26, 1951. The program for the three day meeting will consist of papers dealing with goitre and other diseases of the thyroid gland, dry clinics and demonstrations.

OBITUARIES

Dr. Albert Culton, aged 87, of Wallace, N.S., passed away January 19, following a week's illness. He practiced in Shubenacadie from 1912 to 1919. In 1919 he went to England where he took a postgraduate course. Returning to Canada for a time he practiced in Sydney and later settled in Wallace permanently.

Dr. Alexander James Fisher, aged 46, died on January 22 at his home following a heart attack. Dr. Fisher was associated with the Calgary Associate Clinic, and a member of the Pacific Northwest Obstetrical and Gynæcological Asssociation. Born and educated at Stratford, Ont., he graduated from the University of Toronto medical school in 1928. In 1930 he went to Calgary. He is survived by his widow, two daughters and two sons.

Dr. Perry Gladstone Goldsmith, aged 77, died suddenly on January 21 in Toronto. He retired from medical practice last July. A former professor of oto-laryngology on the staff of the University of Toronto for some years, he was also head of the department of otolaryngology of the Toronto General Hospital. Dr. Goldsmith served with distinction in the First World War with the Canadian Army Medical Corps.. He was mentioned in dispatches and in 1919 was presented with the O.B.E. He held the rank of colonel and took the first field ambulance into France. For a time Dr. Goldsmith was in charge of the military hospital at Taplow, England. Born at Warkworth, he was a graduate of Trinity Medical College. In 1934 he was elected president of the American Laryngological, Rhinological, Otolaryngological Society. An ardent gardener, his rock garden was noted as one of the most outstanding in Canada.

Dr. James A. Gorrell, died on January 24, in Vancouver. Born at Palmerston, Ont., in 1878, he moved west and settled at Pilot Mound in 1881. He attended school there, later coming to Winnipeg and graduating from Wesley (now United) college in 1904. He received his medical degree from Manitoba Medical college in 1908.

Dr. Gorrell was acting superintendent of Ninette sanatorium for a year, and then was associated with the Drs. R. M. Simpson and J. Halpenny in Winnipeg. He specialized in surgery, and was on the surgical staff of the medical college and the Winnipeg General Hospital. In 1929 he retired from active practice, and moved to Victoria where he lived for two years, before going to Vancouver. Surviving is his widow.

Dr. G. H. Ross Hamilton, aged 61, prominent physician and surgeon of Chatham died on February 11. A native of Chesterville, he graduated from the University of Toronto in 1910. He subsequently took postgraduate work at Edinburgh University where he received the F.R.C.S. Dr. Hamilton first practised in Petrolia for 12 years then practiced in Chatham. Following his graduation from Edinburgh University in 1916, Dr. Hamilton enlisted for service. Following his discharge he joined the Canadian Pensions Branch. He also served as an examiner in surgery for the Dominion, and in council examinations at London. Surviving are his widow and one daughter.

Dr J.-C. Hardy survenu est décédé le 29 novembre, 1950, à Dawson Creek, B.C. où il résidait depuis près de deux ans. Il était âgé de 69 ans. Pendant 18 ans il a pratiqué la médecine dans la paroisse. Le Dr Hardy laisse son épouse et ses trois fils.

Dr. Bruce Hill, aged 73, well known Winnipeg resident, died on December 28, 1950. Born in Morden, he received his early education there. Later Dr. Hill attended Manitoba College, and in 1901 graduated from Manitoba Medical College. He is survived by his widow.

Dr. Walter Henry Edward Hills, aged 64, died on January 30, following an illness of several months. Born at Halifax, Dr. Hills was a graduate in chemistry from Dalhousie University and an honours graduate in medicine from Queen's University. During the First Great War he served with the Canadian medical corps and took postgraduate work at Harley St. Heart Hospital, London, Eng. He is survived by his widow, one son and four daughters.

Dr. Arnot G. V. Leishman, aged 73, died February 5 at Grace hospital, Winnipeg. He was a former professor of otolaryngology at the University of Manitoba. Born at South Gore, Ont., Dr. Leishman came to Manitoba in 1900. He graduated from the University of Manitoba in 1905 and began his medical practice at Shoal Lake, later moving to Winnipeg. From 1923 to 1939 he was associate professor of otolaryngology. Surviving are his son and a daughter.

Dr. Wallace Zyer Lincoln, aged 72, died in Calgary on December 16, 1950. Instrumental in starting the local chapter of the Victorian Order of Nurses, Dr. Lincoln took a keen interest in civic affairs and for four years served as alderman on the city council. He was also chairman of the public library for many years. Dr. Lincoln was past president of the Alberta Medical Association as well as a member of the board of executives of the Canadian Medical Association. He was born in Stanstead, Que., and graduated from McGill University in 1904.

Dr. Dave Lougheed, aged 35, of Chapleau, Ont., died on December 12, 1950. A native of Thornbury, he attended public and high school there, entered the University of Toronto. He graduated with a B.A. degree in 1937. In 1939, he received his M.A. degree in physiology and then at the Banting Institute. He worked under direct supervision of Sir Frederick Banting. He graduated in medicine in 1942, from the School of Medicine, and went to Sudbury, practicing for several months as an associate in the Sudbury Clinic before moving to Chapleau. He is survived by his widow and four children.

Dr. Edward Murray MacDonald, well-known medical practitioner in Sydney for the past 50 years, died in Los Angeles, Calif., on December 29, 1950, after a brief illness. He was 81. One of the two surviving Dalhousie graduates in medicine of 1898, the well-known Cape Breton doctor retired only last year after a long record of service in Sydney. Beside his widow, who is residing in Baddeck, Dr. MacDonald is survived by two daughters, one son, one sister, and one brother.

Dr. Charles Mackay of Fredericton, died late in January, at the age of 69. Dr. Mackay was born in Toronto, and received his education there, graduating from the University of Toronto. He served in the C.A.M.C. in the first World War, and settled in Fredericton in 1920. In the second World War he served with the Department of National Defense. He was coroner for York County for many years. He was a member of the N.B. Medical Society, Canadian Medical Association, The Canadian Legion and a Mason. Dr. Mackay was a genial physician, with many friends in medical circles, and throughout the Province of New Brunswick, he was known and respected as a good citizen.

Dr. J. T. MacKay, aged 72, a pioneer Saskatoon physician, died on December 25, 1950. He was born in Ontario and obtained his medical degree at the University of Toronto. He went to Saskatoon in 1910, and, after several years' practice, moved to Oregon for a brief period before again returning to Saskatoon. He retired from active practice in 1947. He is survived by his widow and two daughters.

Dr. E. K. MacLellan of Halifax, a specialist in obstetrics who became recognized as one of Canada's outstanding men in this field, died on January 25. He was 62. For many years he was professor of obstetrics at Dalhousie University. In 1929 he was made a Charter Fellow of the Royal College of Surgeons. Three years later he was elected member of the Royal College of Obstetricians and Gynæcologists and in 1935 was raised to Fellowship.

Dr. MacLellan was born in 1888 at Pictou, N.S. He studied first at Pictou Academy and, after 1900 attended Halifax Academy. After graduating from Dalhousie Medical School in 1909, before he was 21—he was one of the youngest graduates in Nova Scotia—Dr. MacLellan did postgraduate work at Sloane Hospital, New York City, and then opened a practice at Mahone Bay, N.S. Subsequently he returned to Halifax where he opened the Halifax Hospital for Women, first maternity hospital in the province. At the outbreak of the First World War, Dr. MacLellan enlisted for service overseas. From 1915 to 1918 he was a

member of the Dalhousie University Medical Unit in England and France. When he returned from overseas in 1918, he became Chief Medical Officer of Pine Hill Military Hospital in Halifax. In 1919, he joined the staff of Camp Hill Military Hospital, remaining there as Chief Medical Officer until 1938. He also carried on private practice and university teaching until that time. He is survived by his widow, one daughter and one son.

Dr. Donald Alexander MacLeod died at Hamilton on January 13. He was 67. A graduate of McGill in 1913 he opened practice in Hamilton 32 years ago. Dr. MacLeod served with the Canadian Army Medical Corps during the first World War and was a medical examiner during the first and second World Wars. He leaves his widow and three daughters.

Dr. Daniel Stewart Macnab, aged 71, one of the founder of the Calgary Associate Clinic, died on February 2, in Calgary after a lengthy illness. Dr. Mcnab was born in Malagash, N.S. in 1879, and attended public and high school in that province. He received his medical education at Bellevue Medical College, New York, graduating in 1907. Two years of postgraduate work at Bellevue hospital followed. In 1910 he came west to Calgary to open his practice. He became a Fellow of the American College of Surgeons in 1920, and a Fellow of the Royal College of Physicians and Surgeons of Canada in 1928. He was president of the Calgary Medical Society after being on its executive for several years; president of the Alberta Medical Association in 1935; and president of the Alberta branch of the Canadian Medical Association in 1936. He served a term as governor of the American College of Surgeons, a distinction unusual for a Canadian. During 40 years' practice in Calgary, Dr. Macnab was a familiar figure around the Holy Cross hospital and it was partly due to his encouragement and advice that the hospital facilitiess were expanded from time to time. Surviving are his widow, a daughter and a son.

Dr. James Marshall Martin, aged 56, who went to Chatham from Oil Springs 20 years ago, and became one of the best known physicians of the district, died on January 11 at his home in Chatham Township. He suffered a heart attack a year ago, but in spite of failing health continued his work to the time of his death. He was a native of Beeton and spent his youth at Stayner. For the past two years at Chatham he had conducted a clinic in association with Drs. Glen and MacDonald. Surviving besides his widow, are two sons and a daughter.

Dr. Edward Allister McCulloch, aged 72, died on December 30, 1950, in Toronto. Born at Keene, Dr. McCulloch received his early education at Bowmanville and Napanee. He graduated in arts from Victoria College in 1901 and three years later in medicine from the University of Toronto. For a time he practiced and later supervised the building of the London Sanatorium in Byron. He returned to Toronto in 1910 and established a practice. Dr. McCulloch was a member of the board of the University of Toronto Medical Library and formerly on the senate of Victoria University. He leaves his widow, a daughter, and a son.

Dr. Alexander McNeil McFaul, died on January 21 inhis 89th year. He was well known in medical circles throughout the province and a prominent citizen of Collingwood since 1900. His death followed a lengthy illness. A graduate of Victoria Medical College at the University of Toronto, Dr. McFaul set up his first practice in Stayner on June 1, 1878. In 1900 he went to Collingwood and in addition to his general practice was house surgeon at the General and Marine Hospital. In 1928, he entered a partnership with Dr. C. W. Maitland and continued until May 31, 1937, when he retired on the completion of fifty years in the medical profession.

Vitally interested in the welfare of his home community, he served for forty years as member of the Board of Education and occupied the chairman's office for several years. Surviving him are one son and two daughters.

Dr. S. D. McKinnon, aged 46, died on December 14, 1950, at Rouyn, Que., after a lengthy illness. Dr. McKinnon was appointed surgeon-in-chief of Youville Hospital, Rouyn last year. He was born in Fort Qu'Appelle, Sask., in 1904. He earned his Bachelor of Science degree at Columbia Academy, Dubuque, Iowa, in 1922, and his M.D. degree at McGill University in 1930. He went north after internship at Royal Victoria Hospital, Montreal, in 1930, Grey Nuns' Hospital in Regina, 1931, and the Montreal General Hospital in 1932. Soon after the outbreak of war in 1939, Dr. McKinnon joined the Royal Canadian Army Medical Corps as a surgical specialist with the rank of major. He served in England and in Normandy with No. 8 Canadian General Hospital, and was later appointed Commandant of the No. 10 Canadian Field surgical hospital. He returned to practice after three years overseas. He was a member of the Royal College of Physicians and Surgeons. He was president of the medical board of Youville Hospital three times: in 1932, 1947 and 1948. He is survived by his widow and 3 children.

Dr. Jean Henri Maynard, regional medical officer in Montreal for the Ministry of Health of the Province of Quebec in which he served over 25 years, died on January 10 after a long illness. Born in St. Johns, he studied at Ste. Marie College and graduated in medicine from Laval University in 1906, after which he practised in Montreal for several years before joining the Quebec health department. Distinguishing himself in medicine, he was awarded a prize by the Rockefeller Institute of New York in 1937. He was well known in sports circles. In his youth he played goaler for the Wanderers Hockey Club. He was a past director of the Canadian Red Cross Society. He is survived by his widow and a daughter.

Hon. Dr. Raymond D. Morand, aged 64, died suddenly of a heart condition on February 3 in Windsor. Dr. Morand was born in Roseland and lived in Windsor for 37 years. He graduated from the University of Western Ontario in 1912. He a Conservative, began his political career in 1925 when he was elected to the Federal Parliament in Essex East and was the first French-Canadian from Ontario to hold the rank of cabinet minister in the Federal Government. Survivors are his widow, one son and two daughters.

Dr. George R. Philp, aged 75, former city coroner, died on February 10 in Toronto, after a prolonged illness. Dr. Philp served overseas during the First World War with the Canadian Army Medical Corps with the rank of colonel. It was on his suggestion that the Canadian Army Hospital was established on the estate of Lady Astor at Taplow, Eng. Lady Astor, when speaking at Government House, during a visit to Canada in 1936, paid tribute to Dr. Philp's inspiration. He retired as coroner in 1939. He was born at Waterdown and graduated in medicine from the University of Toronto in 1909. He leaves his widow and a daughter.

Dr. Francis Patrick Quinn, aged 64, a former Ottawa physician until his retirement from practice some years ago, died suddenly in Civic Hospital, Ottawa, on January 30. Born in the Capital, Dr. Quinn attended St. Patrick's School and Ottawa University. He entered McGill University in 1904. He was not only an honour graduate but an outstanding athlete at McGill. He played on McGill football teams of '04, '05, '06, and '07. Dr. Quinn practised medicine in Ottawa from 1910 until he retired. He was for many years physician for the Ottawa Fire Department. Surviving are his widow, five daughters and one son.

Dr. Frederick William Routley, aged 70, died on February 12, in Toronto General Hospital. A leader in the field of public health service in Canada for more than a quarter-century, Dr. Routley gave up a lucrative medical practice in Maple in 1921 to join the Red Cross. He became national commissioner the year before the Second World War and guided the society through the ensuing years. Dr. Routley, who represented the Canadian society on many world medical organizations, retired from the job of commissioner at the end of 1948. Dr. Routley's Red Cross work was recognized by three foreign countries after the Second World War. In 1947 he was awarded the service medal of the Greek Red Cross. Last July he received the French Cross of Chevalier of the Legion of Honour, and less than three months ago he was awarded one of the highest decorations of The Netherlands, the Commander's Cross of the Order of Orange Nassau. He was a founder of the York County Medical Society and the first president of the Canadian Hospital Association from 1930 to 1934. He had been honorary secretary of the Ontario Hospital Association since 1924. He is survived by his widow and a daughter.

Dr. J. Murray Scott died in Eureka, Penn., on December 31, 1950. He was born in Downie township in 1905, and graduated in medicine from the University of Toronto in 1930. He did postgraduate work at Toronto, and research at the Banting Foundation and the Toronto General Hospital. In his medical practice, which he carried on in Toronto from 1932 to 1937, he specialized in internal medicine, endocrinology and the care of diabetes. Dr. Scott joined the department of clinical investigation of the Upjohn Co., of Kalamazoo, Mich., in 1937, and later was appointed medical director of Ayerst, McKenna and Harrison, a position he held until last year. For the last year he had been medical director of Sharp and Dohme Inc. of Philadelphia. He leaves his widow and four children.

Dr. Ignatius Scozzafave, Welland physician, died on January 31 at Millard Fillmore Hospital, Buffalo, after a short illness. Before coming to Welland, Dr. Scozzafave interned in the Sisters Hospital, Buffalo. A native of Rovito, Italy, Dr. Scozzafave resided two years in Buffalo and 27 years in Welland. He is survived by his widow and two daughters.

Dr. William John Simpson, aged 86, reputed to be the oldest practicing physician in Alberta died in Edmonton on January 30. Dr. Simpson practiced medicine for 52 years, being a 1899 graduate of Queen's University. Upon graduation he came west and settled at Lacombe, where he served until 1928, when he moved to Millet. He was a member of the first medical council of the North West Territories in 1899. In 1948 he was given an honorary life membership in the Canadian Medical Association. While in Lacombe Dr. Simpson was active in many community organizations. At Millet he was also active in community affairs and headed the Red Cross section in that district.

Dr. Fred D. Sinclair of Cloverdale, died in Vancouver General Hospital on January 28. He came to Cloverdale in 1911, and practised in the municipality except during World War I. Born in St. Stephen, N.B., 67 years ago, he attended Dalhousie and McGill Universities. In 1913 he was appointed medical health officer for Surrey, and has held this post ever since. In 1915 Dr. Sinclair was granted leave of absence to join the Army and served Overseas, returning to his practice in 1919. Besides his widow, he is survived by one son and two daughters.

Dr. Philip P. Smyth, died February 6 at St. Joseph's Hospital, Toronto. He was 65. Born in Tottenham, he graduated from McGill University in 1914. He practiced in Alberta and British Columbia until 1936, when he came to Toronto. He leaves his widow and a daughter.

Dr. Joseph Stewart, aged 64, died suddenly on January 24, in St. Thomas, Ont. A graduate of the Queen's University Medical School in 1915, Dr. Stewart served with the Canadian Army Medical Corps during the First World War, serving in Egypt during part of the time of his overseas service.

Following postgraduate studies in the United States after the war, he joined the Ontario Department of Public Health in 1924, and served in nearly all the mental institutions of the province. In time he became superintendent at the Queen Street West Hospital in Toronto before going to a similar post in Hamilton. Four years before coming to St. Thomas he was superintendent of the Ontario Hospital in Kingston. Since 1948 he was superintendent of the Ontario Hospital south of St. Thomas. Surviving is his widow.

Dr. J. R. Le Touzel, well-known London physician, artist and soldier, died on January 17 in St. Joseph's Hospital after five weeks' illness. He was 80. Dr. Le Touzel practised medicine in London more than 25 years, until last November. Born in Goderich, Dr. Le Touzel served with the Canadian army in the Boer War. Later he graduated from McGill University and continued his medical education in Edinburgh and Glasgow. He went to London in 1916 and served as officer commanding Wolseley Barracks for a short time before going overseas. He returned in 1920 and for five years was an instructor in pharmacology at the University of Western Ontario Medical School. In 1925 he set up his own practice. He is survived by his widow.

Dr. Bertha Wilensky, aged 46, a well-known Toronto medical practitioner, died suddenly on February 12. A resident of Toronto since she came here with her family from Russia at the age of four, Dr. Wilensky attended public school and collegiate, and was a graduate of the school of medicine of the University of Toronto. After graduation, she did postgraduate work in New York and New Jersey. Dr. Wilensky was a staff member of the Women's College Hospital and the Toronto Western Hospital.

Dr. Wilfred Albert Wilson died at his home in Edmonton, on January 23, at the age of 76. Born in Carleton Place, he graduated in medicine from McGill University in 1899 and did postgraduate work in Edinburgh, Scotland, before settling in Edmonton in 1904. For many years Dr. Wilson was chief medical officer of the C.N.R. in Alberta and was associate professor of clinical surgery at the University of Alberta. He retired from active practice in 1943 and became chief medical officer to the Alberta Workmen's Compensation Board. He is survived by two sons and one daughter.

ABSTRACTS FROM CURRENT LITERATURE

Medicine

Urinary Diastase in Mumps. Nothman, M. N.: *New England J. Med.*, **244:** 9, 1951.

Increased urinary excretion of diastase was found in all of 30 cases of mumps and in none of ten cases of swellings in the facial area from other causes. An increased urinary diastase is therefore considered to be a valuable diagnostic measure in mumps, especially in cases where the disease is limited to, or first manifested in, the submaxillary glands and so making clinical differentiation difficult. NORMAN S. SKINNER

Cardiac Arrest. Anderson, R. M., Schoch, W. G. and Faxon, H. H.: *New England J. Med.*, **243:** 905, 1950.

Cardiac arrest is a surgical emergency requiring immediate treatment since few patients can survive the anoxia produced by more than three minutes of cardiac standstill. It is imperative that the anæsthetist must

be alert to recognize the onset, that the surgeon be trained in the emergency technique of exposure of the heart, either through the left diaphragm from below or through the anterior left chest wall, and that an emergency surgical kit be easily available for immediate use. After the heart is exposed it should be manually compressed at least sixty times per minute to achieve the most efficient blood flow. The authors also recommend the immediate availability of a syringe containing 9.5 c.c. of 1% procaine solution and 0.5 c.c. of 1:1,000 epinephrine for intravenous or intracardiac injection. Artificial respiration should be maintained by the anæsthetist through rhythmical compression of the rebreathing bag filled with oxygen.

Susseccful employment of the above regimen in the resuscitation of a 78-year old male who developed cardiac arrest on the operating room table is discussed in detail.

NORMAN S. SKINNER

The Effect of the Rice-Fruit Diet on the Composition of the Body. Chapman, C. B., Gibbons, T. and Henschel, A.: *New England J. Med.*, **243:** 899, 1950.

Because of the controversial views existing concerning the effects of the rice-fruit diet on the bodily economy of patients being treated for hypertension carefully controlled studies were carried out in eight male patients. Significant lowering of the blood pressure occurred in four. Steady weight loss of about 1.5 kg. per week was shown to be due mainly to loss of body fat and extracellular fluid volume. Prompt cessation of weight loss was brought about by the addition of salt-free protein to the diet without deleterious effect upon the blood pressure. When salt was added to the diet there was prompt return of symptoms and of blood levels which had shown lowering.

The rice-fruit diet caused a rapid decline in the level of the serum cholesterol, a finding which is at variance with the generally held view that the serum cholesterol is not influenced by diet.

The authors feel that this diet may be justifiably used for short periods in overweight hypertensives with normal renal function. Its prolonged use is objectionable on theoretical grounds and may actually be dangerous, because of the effects of the resulting starvation and sodium depletion.

NORMAN S. SKINNER

Life Expectancy and Probable Disability in Multiple Sclerosis. Ipsen, J.: *New England J. Med.*, **243:** 909, 1950.

A survey of multiple sclerosis was carried out in Boston and Brookline, Mass., during the years 1939 to 1948. These figures are studied in an effort to obtain information regarding the incidence and prognosis of the disease. The average annual prevalence was 51 cases per 100,000 population. Females were more often affected by the disease (64 to 37). The most common age group affected was from 30 to 35 years.

Division of cases into different groups of varying severity showed about half the cases to be ambulatory and approximately a third as gainfully employed. Median life expectancy after onset is fourteen years for males and twenty for females. Half the patients discontinue work about five years after the disease becomes evident.

NORMAN S. SKINNER

Evaluation of the Peritoneal-Button Operation for Ascites. Chalmers, T. C., Eckhardt, R. D. and Davidson, C. S.: *New England J. Med.*, **243:** 857, 1950.

The peritoneal-button operation was employed in the treatment of 17 patients with ascites. Five died within two weeks, ascites promptly recurred in seven and five cases seemed to be benefited for periods of from three to fourteen months. The results obtained are considered to be far inferior to those seen in patients placed on a low sodium regimen, which is considered to be the best therapy at present available for the control of ascites.

NORMAN S. SKINNER

Aureomycin in the Treatment of the Common Cold. Hoagland, R. J., Deitz, E. N., Myers, P. W. and Cosand, H. C.: *New England J. Med.*, **243:** 773, 1950.

No significant difference was found in the proportion of cures obtained in two groups of patients with coryza, one group receiving aureomycin and the other a placebo. Essentially the same proportion of patients in each group reported slight or no benefit from the medication. It was again demonstrated in this study that about half the patients treated with an inert material reported improvement or cure within twenty-four hours.

NORMAN S. SKINNER

Surgery

The Value of the Fibrinogen-B Test in Intravascular Thrombosis in Surgical Subjects. Trethewie, E. R., Carman, R. D. and Day, A. J.: *Brit. J. Surg.*, **38:** 30, 1950.

Over a hundred patients who underwent an operation on the lower half of their bodies were investigated regarding thrombosis and embolism, fibrinogen-B, and response to heparin. About half showed a positive fibrinogen-B, and of these patients, half were given heparin prophylactically. Venous thrombosis and pulmonary infarctions developed in both the fibrinogen-B positive and fibrinogen-B negative groups and it is concluded that the estimation of fibrinogen-B was not of any particular practical value. No significant help regarding the imminence of thrombosis was rendered from the estimation of clotting times at room temperature or at 37° C. though the 37° C. estimation was more consistent. It was found that a smaller dose of heparin than that usually advised, especially with regard to the frequent dosage, was satisfactory in cases of embolism and thrombosis.

BURNS PLEWES

Internal Drainage in the Treatment of Pancreatic Pseudocysts, Sterile and Infected, and Liver Cysts. Rapant, V. and Sery, Z.: *J. Intern'l. Chir.*, **10:1:** 22, 1950.

Total extirpation of a pancreatic cyst is technically difficult and dangerous. Marsupialization has the disadvantage of prolonged and exhausting postoperative treatment. Twa cases of pancreatic cyst drained by simple anastomosis to the posterior gastric wall through an anterior gastrotomy and a case of large cyst of the liver which was anastomosed to a functioning gall bladder are described. The dangers of peritonitis were averted because the structures were adjacent and by the use of penicillin. All 3 patients did well and remained well during a period of 1½ years' follow-up.

BURNS PLEWES

Acute Volvulus of Small Intestine. Moretz, W. H. and Morton, J. J.: *Ann. Surg.*, **132:** 899, 1950.

Thirty-six cases of acute volvulus of the small bowel occurring in patients varying in age from 52 hours to 73 years are reviewed. Twenty-five had had a previous laparotomy and in 28 acquired or congenital bands were predisposing factors. The usual symptoms were severe, cramp-like upper abdominal pain with nausea and vomiting, associated with signs of abdominal tenderness and distension. Peristalsis was absent in late cases and hyperactive in the early ones. X-ray evidence of small bowel obstruction was present in 70%. The mortality rate was 30%. Half required only release of adhesions and untwisting of the volvulus. Fourteen required resection. Fatal cases had had symptoms for an average of six days. The average duration in non-fatal cases was two days. The mortality rate has greatly decreased since 1940.

BURNS PLEWES

Considerations of Bronchiogenic Carcinoma. Graham, E. A.: *Ann. Surg.*, **132:** 176, 1950.

The development of pneumonectomy for carcinoma of the lung is reviewed, and the rapid increase in its incidence examined. Some factor or factors have arisen in the past 40 years to cause the undoubted increase, but it is as yet unrecognized. A positive diagnosis either by bron-

choscopy or examination of bronchial washings can be made in 75% of cases, but if a male of middle age or more is expectorating blood-tinged sputum and has a suspicious shadow in the x-ray, and does not have active tuberculosis or bronchiectasis, he should have an exploratory thoracotomy. Too many patients present themselves too late for pneumonectomy. Of 211 cases with a positive microscopic diagnosis, in only 27% was pneumonectomy possible. Pleural effusion does not contraindicate operation unless tumour cells are found in it. Pneumonectomy now has an operative mortality rate of 10%. In the author's experience, 28% of those who had total pneumonectomies were living more than 5 years after their operation. The evidence that the so-called bronchial adenoma is potentially malignant is examined, and it is believed to be true by the author.

BURNS PLEWES

Histoplasmosis: A Common Cause of Appendicitis and Mesenteric Adenitis. Raftery, A., Trafas, P. S. and McClure, R. D.: *Ann. Surg.*, **132:** 720, 1950.

At the Henry Ford Hospital 2,135 cases of appendicitis and mesenteric adenitis were seen in 10 years. Of these 1,049 cases of acute appendicitis were examined closely and 58 were diagnosed histoplasmosis, 35 out of the 768 chronic appendicitis cases and 10 of the 164 normal appendices contained demonstrable Histoplasma. A uniform histologic picture is described and lymphoid hyperplasia is the outstanding feature. Culture of this yeast is difficult but the disease can be duplicated in mice. Patients with this infection suffer from a low-grade chronic disease. It is believed that the lymphoid hyperplasia may be a cause of acute appendicitis.

BURNS PLEWES

General Hypothermia for Experimental Intracardiac Surgery. Bigelow, W. G., Callaghan, J. C. and Hopps, J. A.: *Ann. Surg.*, **132:** 531, 1950.

Continuing their experiments on hypothermia, this Toronto group describe the use of electrophrenic respiration, an artificial pacemaker for cardiac standstill and radio-frequency rewarming. It was found possible to exclude the heart from the circulation for periods of 15 minutes in dogs at a body temperature of 20° C. with survival. In most of these animals the heart has been opened and sutured during the period of exclusion. Periodic electrical stimulation of the phrenic nerve was used as a form of artificial respiration in the lower temperature range. An artificial pacemaker in the form of periodic electrical stimulation of the SA node successfully restored heart action in cardiac standstill in the cold state.

BURNS PLEWES

Valvulotomy for the Relief of Congenital Valvular Pulmonic Stenosis with Intact Ventricular Septum. Blalock, A. and Kieffer, R. F.: *Ann. Surg.*, **132:** 496, 1950.

Valvular pulmonic stenosis with interventricular defect is referred to as "pure" pulmonic stenosis to separate it from the tetralogy of Fallot, where the stenosis is usually in the pulmonary conus. The operation described and the special instruments used are those of Russel Brock and some patients operated upon by him when he visited Johns Hopkins are included in the 19 cases reported. The diagnosis, pre- and post-operative care, as well as details of the operation are described. There were two deaths in the series, none in the last 11 operations, and all survivors were improved.

BURNS PLEWES

Restoration of Facial Function by Nerve Anastomosis. McKenzie, K. G. and Alexander, E.: *Ann. Surg.*, **132:** 411, 1950.

End-to-end suture of the facial nerve or nerve graft is the best surgical treatment of the severed nerve, but this is impossible when a length of it has been removed with an acoustic neuroma. Hypoglossal-facial anastomosis was performed on 33 patients during the past 15 years with excellent cosmetic results in 75%. They had an animated facial appearance and a symmetrical face at rest and were pleased with the result. Speech was not disturbed by paralysis of half the tongue.

Those patients who had a spinal accessory facial anastomosis were not nearly as satisfactory. Over-action of the face accompanied a vigorous shrug of the shoulder and the atrophy and drop of the shoulder was disfiguring. Descendens hypoglossi suture to the facial nerve and the distal end of the hypoglossal nerve was done in two cases. There was no return of facial movement. Seven patients had the descendens hypoglossi sutured to the distal stump of the hypoglossal. Atrophy of the tongue was not prevented.

BURNS PLEWES

The Effect of Potassium Deficiency on Intestinal Motility and Gastric Secretion. Webster, D. R., Henrikson, H. W. and Currie, D. J.: *Ann. Surg.*, **132:** 779, 1950.

Studies on rats fed a diet deficient in potassium showed reduced smooth muscle motility, accumulation of fluid and gas in the gastro-intestinal tract. In potassium deficient dogs water exchange and the volume of gastric secretions is increased. Where there is continuous suction and a cæcostomy, potassium as well as fluids are lost, and such a patient may suffer inhibited intestinal musculature. Hydration and electrolytic balance can only be restored if potassium is administered.

BURNS PLEWES

Obstetrics and Gynæcology

The Treatment of Iron Deficiency Anæmia of Pregnancy with Intravenous Iron. Kartchner, F. D. and Holstrom, E. G.: *Am. J. Obst. & Gynec.*, **60:** 1288, 1950.

Twenty-six patients were treated with intravenous saccharated oxide of iron. Nine had iron deficiency anæmia with hæmoglobins varying from 5.4 to 10 gm. per 100 c.c. of whole blood, 8 had 10.5 gm., 9 had normal hæmoglobin. Results indicate that in iron deficiency anæmia of pregnancy, intravenous iron produces a greater total and a more rapid increase in hæmoglobin than oral iron. Toxic reactions were significant; 65% had no reactions, 27% had mild, 6% moderately severe and 2% severe reactions. Most frequent reactions were light-headedness, suffusion, weakness, nausea, venospasm, headache, sacral backache. Thrombophlebitis and shock-like state occurred twice, both times with large doses.

Following a test dose of 100 mgm. up to 300 mgm. of intravenous saccharated oxide of iron can be given daily without materially increasing toxic reactions. Doses of 100 mgm. to 200 mgm. are recommended. The best method of injection is to dilute the saccharated oxide of iron solution in the patient's own blood. Injection should be done slowly and care taken to avoid subcutaneous injection of the material. Intravenous saccharated oxide of iron for the treatment of iron deficiency anæmia of pregnancy is effective in those patients who cannot tolerate iron by mouth, who have excessive nausea and vomiting of pregnancy, who have failure of absorption of iron from the gastro-intestinal tract, and who present themselves late in pregnancy with an existing anæmia and insufficient time for response to oral therapy.

ROSS MITCHELL

Correlation of Blood Loss with Blood Volume and other Hæmatological Studies Before, During, and After Childbirth. Lowenstein, L., Pick, C. A. and Philpott, N. W.: *Am. J. Obst. & Gynec.*, **60:** 1206, 1950.

Serial hæmatologic and blood volume determinations using the T 1824 dye-hæmatocrit were performed upon 37 patients before and at varying intervals after delivery. In the last group of 9 patients, vaginal and perineal blood loss was measured. The red cell volumes showed no significant differences 24 hours, 48 hours, and 8 days post partum.

The blood volume changes in all series studied were not attended by comparable changes of the hæmoglobin concentration and the hæmatocrit. The blood loss from

active circulation in 37 normal women calculated from antepartum and postpartum blood volume changes averaged 991 ml. This greatly exceeded both the visually estimated blood loss and the directly measured blood loss.

It is suggested that the permanent loss from the active circulation accounts for this discrepancy. This loss and the increase of apparent blood loss as determined by blood volume studies 15 to 90 minutes after delivery and on the second postpartum day may be partly due to trapping of circulating blood in the body of the uterus. ROSS MITCHELL

Kell-Cellano Blood Group System in Pregnancy and Transfusion. Cochrane, J. B., Malone, R. H. and Dunsford, I.: *Brit. M. J.*, **2:** 1203, 1950.

In 1946 Coombs *et al.* described a new antigen-antibody system (Kell) unrelated to the Rh system but nevertheless capable of producing hæmolytic disease of the newborn. In 1949 Levine *et al.* found another antibody (Cellano) which also caused hæmolytic disease of the newborn and showed that the Kell and Cellano genes are alleles.

A case is described of a woman with a record of two marriages, two blood transfusions and four children, the second and third of which died *in utero*. Blood collected from the mother after the delivery of the third child was found to contain anti-Kell active at 37° C. in saline and demonstrable with anti-human globulin but inactive in human serum or bovine albumen. The probabilities are that she was immunized by the blood transfusion.

The Kell antibody is of considerable clinical importance as a cause of transfusion reactions and of hæmolytic disease of the newborn. Its presence can be demonstrated by means of the indirect Coombs test but will not usually be detected by routine cross-matching techniques ordinarily employed in hospitals. ROSS MITCHELL

Neurology and Psychiatry

Polycythæmia Vera and the Nervous System. Johnson, D. R. and Chalgren, W. S.: *Neurology*, **1:** 53, 1951.

Polycythæmia vera is not a common disease, yet its clinical and pathological features are such that it should be considered in the diagnosis of many neuropsychiatric syndromes. The etiology is unknown. Its basic pathologic defect is overproduction of blood cells in the bone marrow. Nervous system involvement in polycythæmia is a cardinal feature of the disease. Nervous system symptoms are present in at least three-fourths of all cases, and in one-third of all cases, neurologic symptoms are the most important complaint. The most common symptoms are non-specific, and include headache, vertigo, fatigue and weakness. Visual disturbances, paræsthesias, and vague aches and pains are frequent. The variety of symptoms make the diagnosis of neurosis a likely one. A confusional type of psychosis may develop occasionally, and many of these symptoms disappear when the blood values are restored to normal.

Objective neurological findings are present in over one-fourth of the patients with nervous system symptoms. They are usually focal in nature caused by vascular thrombosis. Hemiplegias are most common, but extrapyramidal syndromes may also occur. The two important characteristics of the cerebral lesions are: (1) their occurrence in multiple areas of the brain; (2) the occurrence of repeated thrombosis followed by more or less complete recovery.

In some cases, lesions appear to be progressive. These may be mistaken for brain tumour, especially if increased spinal pressure with choked disc is present. The authors postulated the possibility of an erythrocyte stimulating centre in this area. Occasionally diencephalic lesions are associated with polycythæmia. Paræsthesias are a common complaint, but actual peripheral neuritis is rare. The authors presented a case of generalized neuritis and polycythæmia. As well as a review, five personal observations and one autopsy were presented.

J. PRESTON ROBB

Industrial Medicine

The Place of Medicine in Occupational Health. Stewart, D.: *J. Roy. San. Inst.*, **70:** 470, 1950.

With the expanding scope of industrial health services the term "industrial medicine" is being replaced by "occupational health". The occupational health of today is not only a rapidly expanding branch of medicine but a responsibility of industry. In this article which was the presidential address given at the section "Hygiene in Industry" of the Health Congress at Eastbourne, in April 1950, the author discusses the rôle of medicine in this field. By itself medicine cannot hope to solve all the health problems of the working group, but with the informed collaboration of management and employees, educationists, sociologists and research workers, it can play an important part in providing the community with a really complete health service.

After tracing the development in England from the institution of the first industrial medical services between the two wars, through the changes and expansion of the following years, he discusses occupational health as it is today. It is defined as being concerned with the duty of individuals in relation to the physical and psychological demands of their occupation, and with the study of work and the work environment in relation to their effects on health. It includes the subjects of industrial hygiene, industrial diseases and toxicology, industrial surgery and industrial psychology. The author emphasizes that no doctor could be an expert in all these fields; he is only one of a team of individuals. His responsibility, however, is such that he is the pivot and the key man in occupational health.

Reference is made to both research and education. Under the Medical Research Council many projects in occupational health are now being undertaken. The Industrial Health Research Board is responsible for their general co-ordination. In a number of universities, educational experiments now in progress, are promising. The form of the experiment varies with the different centres. The Department of Occupational Health in Manchester is concerned with both education and research; facilities are being made available for managers and trade unionists as well as for doctors and nurses. In Durham the corresponding department is at present concerned only with research. The Departments of Public Health in Edinburgh and Glasgow Universities include sub-departments of occupational health, both of which have within recent years been closely concerned with postgraduate medical education. In the opinion of the author, the time has come to set up an Institute of Occupational Health, perhaps in London, which could act as a centre for education in this field.

MARGARET H. WILTON

Tuberculosis in Industry. Sutherland, R. B.: *Ont. Med. Review*, **17:** 52, 1950.

In spite of the declining tuberculosis death-rate in Ontario, the problem of tuberculosis as it affects the wage-earner is still important. Recent statistics indicate the death-toll taken by tuberculosis during the wage-earning years; the loss of earning power, the cost of treatment and the hardship associated with the disease must also be recognized.

The possible contributing factors to the higher tuberculosis incidence and mortality rates found in industry and reported in literature, include posture at work, fatigue, poor plant ventilation, extremes of temperature and humidity, gravitation of individuals of poor physical type to certain jobs, close proximity of workers, and, exposure of employees to harmful chemicals, dusts and fumes. The author presents available evidence regarding the significance of these factors. In connection with the relationship of silica exposure to pulmonary tuberculosis, there has been considerable investigation. To date silica dust of respirable size (under 3 microns in diameter) is the only chemical agent definitely known to adversely influence industrial tuberculosis incidence and mortality. Exposure to it is associated with a high incidence of tuberculosis, the incidence rising with the years of exposure and the amount of silica in the lungs. The

infection may precede the silicosis, remain dormant for years and finally become reactivated, or the infection may be superimposed on the silicotic process and then run an acute or chronic course.

Reference is made also to the excessive mortality from tuberculosis which has been noted in many occupations where no exposure to silica dust is entailed. For example, a recent study by Stewart and Hughes revealed that the high death rate from tuberculosis in the boot and shoe industry in Great Britain may be explained as partly due to selective recruitment of employees, and partly to working conditions. The findings here lend emphasis to previous investigations made of the relation of overcrowding or close proximity of workers, to the incidence of tuberculosis in industrial plants.

Annual x-ray of industrial employees has proved of value in producing a decrease in the number of fresh cases found. Of probable greater importance in preventing the development of new cases in industry is the pre-employment chest film.

The question of re-employment is important. Generally speaking, rehabilitation of the older patient should be directed to placing him at his former occupation if possible, provided this does not entail working out-of-doors. In the case of younger patients, whose occupations involve heavy physical exertion or exposure to dampness or to variations of temperature, it is advisable to consider retaining them for employment in less-demanding occupations.

MARGARET H. WILTON

Book Reviews

Modern Trends in Obstetrics and Gynæcology. Edited by K. Bowes, Obstetric Physician, St. Thomas's Hospital; Surgeon, Grosvenor Hospital for Women, London, Eng. 778 pp., illust. 60s. Butterworth & Co. (Canada), Ltd., Toronto, 1950.

This is an ambitious new work. It incorporates fifty chapters on various aspects of Obstetrics and Gynæcology. These range from the primary anatomy of the pelvis to the legal responsibility of the doctor practising in England, not all of which can truly be said to illustrate modern trends. The book would seem to be of most benefit to the advanced student and teacher in the field. With this in view, and bearing in mind the title, there is unevenness in the subjects and their treatment. This is probably inescapable. The newer trends in the normal and deranged physiology of the uterus, pregnancy and labour are uniformly and expertly done. Taken by themselves they would make an excellent monograph, and they should not be missed. On the other hand simple reviews of the literature might have been left to one of the annual reviews. Diabetes, tuberculosis and heart disease as complications of pregnancy are each given a chapter. They are recommended as a source of authoritative help. A very clear chapter in the Rh factor is perhaps the best summary of the subject from a practical standpoint which has appeared recently.

This book will undoubtedly become a "must" for students reading for the higher examinations and the editor is to be congratulated on producing a volume so thoroughly up to date. It is to be hoped that the very scope of the work will not be too ponderous to allow of frequent revision in the light of newer developments.

British Surgical Practice. Under the general editorship of Sir E. R. Carling, Consulting Surgeon, Westminster Hospital; and Sir J. U. Ross, Surgeon and Director of Surgical Clinical Unit, St. Bartholomew's Hospital. Vol. 6, 597 pp., illust., 1949; Vol. 7, 591 pp., illust., 1950. Butterworth & Co. (Canada), Ltd., Toronto.

A few only of the chapters in these volumes can be mentioned. Volume 6 contains amongst other sections on Manipulative Surgery, which is of great interest to the general physician; on Neoplasms, in which the importance of staging except in the rectum is not adequately stressed; on the Œsophagus, which however has two startling omissions—Cardiospasm and the treatment of Œsophageal Varices.

Dr. Cokkinis describes well the diseases of the Omentum as well as its use in operative surgery, both as attached and free grafts. Dr. Riddell deals with the Optic Nerve and gives an excellent description of it. This is followed by Mr. King's article on the Orbit; but here no mention is made of sympathetic ophthalmia. The management of Paralysis by Dr. Guttman stresses mainly the care of the bladder, but also includes that of the skin and bowel and the physical restoration of the patient. This is an interesting and instructive section, and the recoveries are truly amazing.

In Volume 7 Pharyngeal Diverticula are described very clearly and precisely. The article on Physique, Body Build and posture, is very interesting. The changes of posture, habits and idiosyncrasies with age, are extremely well described and make excellent reading. In the section on Radiation the author is extremely fair in his demarcation of the value of radiation therapy. There is a most interesting chapter on Salivary Glands.

In reviewing these volumes it may be said that on the whole they are remarkably complete, concise and clear. Again one can recommend them very highly both to the practising surgeon and to the student preparing for examinations. These articles will enable the latter to make complete, short answers suitable for examination purposes. It is difficult to note any grave omissions except the use of the antibiotics in Tuberculosis. But apart from this the work is far more concise, free from excess words, than any book published on this continent; and it should be emphasized that our Canadian authors are also included, so that it is truly British Commonwealth Surgical Practice and not just the British Isles.

Injuries to the Ankle. J. G. Bonnin, Orthopædic Surgeon, Central Middlesex Hospital. 412 pp. 63s. Messrs. William Heinemann, Medical Books Ltd., London, England, 1950.

This monograph is obviously the product of someone who has done a great deal of clinical and experimental work on the subject, also a person who is a perfectionist for detail. It is the most complete work on this important subject yet presented and is done in an extremely pleasant and readable manner. Mr. Bonnin has taken the sound foundation of Ashurst in respect to the mechanism of ankle fractures and has developed this concept to a very complete degree. The historical section adds a great deal of interest to the subject especially in respect to such well known persons such as Ambroise Paré and Percival Pott, Guillaume Dupuytren and Sir Arbuthnot Lane. Special points in correct radiography of the ankle joint are emphasized, points to which most surgeons and radiographers do not pay sufficient attention. The chapter on the experimental production of ankle fractures is of interest but somewhat too much has been made of the findings of the original experimenters. The chapter on sprains and the hypermobile ankle is adequate but the operative treatment of complete ligamentous rupture would be improved by some diagrams illustrating the surgical steps. The same criticism applies to the other surgical procedures described, being especially important in the common lesion of fracture of the medial malleolus. Diagrams illustrating the various steps in closed reduction would be a valuable addition to the book as well as a short discussion on plaster technique. One can unhesitatingly recommend this volume to every doctor who would treat a fractured ankle and especially those in university circles who instruct the neophyte surgeon.

Selected Studies on Arteriosclerosis. R. Altschul, Professor of Histology, University of Saskatchewan, Saskatoon, Canada. 182 pp., illust. $6.50. Charles C. Thomas, Springfield, Illinois; The Ryerson Press, Toronto, 1950.

This monograph expresses many years of interest and investigation in the fields of human and experimental arteriosclerosis. Dr. Altschul has brought a critical and

morphological approach to the problem as well as an unusually extensive knowledge of the European and American literatures. The book is not exhaustive or encyclopædic. It is addressed to those who are investigators of the fundamental problems of arteriosclerosis and it provides them with a useful and modern morphological foundation to which chemical or physico-chemical observations may be related. There is little of use or interest to the medical practitioner unless this field of research should be his hobby.

Dr. Altschul is lucid, critical and cautious. The work serves to emphasize our great and regrettable ignorance of the morphology and properties of endothelium and vascular intima. A series of observations from his own animal experiments with cholesterol serve to emphasize the widespread and variable tissue changes that the experimental procedures can induce. The monograph is highly recommended to those who by vocation or interest require morphological information concerning endothelium, intima or experimental cholesterol arteriosclerosis.

Antipyrine: A Critical Bibliographic Review. L. A. Greenberg, Associate Professor, Applied Physiology, Yale University. 135 pp. $4.00. Hillhouse Press, New Haven, Conn., 1950.

This reference book consists of a critical analysis of a vast amount of literature on the subject of antipyrine. Eighty-three pages are taken up with a bibliography which runs to a total of over seventeen hundred references, in many languages. The clinical and pharmacologic aspects of the subject are considered fully. Unfortunately the study of total body water is not very fully discussed and some references on this subject have been omitted.

Surgery of the Shoulder. A. F. DePalma, James Edwards Professor of Orthopædic Surgery and head of the Department, Jefferson Medical College, Philadelphia; Attending Orthopædic Surgeon, Methodist Episcopal Hospital, Philadelphia; Attending Orthopædic Surgeon, St. Agnes Hospital, Philadelphia. 438 pp., illust. $19.00. J. B. Lippincott Co., Montreal, 1950.

Dr. De Palma has made a valuable contribution in compiling into one volume such a large amount of information, making this work an excellent reference. The illustrations by the medical artist, Brill, are of high quality and the photographic reproduction excellent.

For recurrent dislocation De Palma accepts the theory of muscle imbalance as the underlying cause and favours the Magnuson operation for its treatment. Like many who have worked in this field he feels the Nicola operation results in too high a recurrence rate. The accurate repair of capsular defects following Bankart and Thomas is discussed and the question rightly raised as to the exact deviation found from the anatomy normal for that age.

There are also chapters on fractures, bone tumours and operative procedures. It might be questioned whether a section on Bone Tumours around the shoulder was absolutely necessary as the types correspond for the most part to those found for all regions of the skeleton. The book will find its place in medical libraries and in the hands of specialists in this field.

Modern Trends in Orthopædics. Edited by Sir H. Platt, Professor of Orthopædic Surgery, University of Manchester. 497 pp., illust. Butterworth & Co. (Canada), Ltd., Toronto, 1950.

This is a valuable text for all who are interested in the advancement of knowledge in the whole field of surgery. Its plan and scope are unique and stimulating and the presentation of each section bears the imprint of ripe experience and constructive thinking.

The introductory section by the editor, Sir Harry Platt, is notable for a discussion of the teaching of orthopædic surgery to undergraduate students of medicine and to graduate students of surgery. This is followed by thirteen chapters each dealing with a specific problem in orthopædic surgery. John Charnley's chapter on fracture treatment is valuable for his thoughtful approach to the basic principles of fracture healing and fracture treatment. G. R. Girdlestone contributes a chapter on tuberculosis of bones and joints which is full of wisdom tried and proved by experience. V. H. Ellis covers the problem of pyogenic infections of joints and bones which has been revolutionized by the introduction of antibiotics. A. R. Jones discusses congenital dislocation of the hip ably and with wisdom. Bryan McFarland gathers together what we know of congenital deformities of the trunk and spine. (It is worth noting that the only research on the experimental production of congenital deformities has come from Professor McFarland's department in Liverpool). Chronic arthritis is ably summarized by Norman Capaner who besides summarizing the various types of arthritis discusses the part which orthopædic surgery can play in its management. An excellent discussion of bone tumours and joint and muscle tumours is contributed by Ronald Barnes. Scoliosis is fully covered by Osmond Clarke with a careful discussion of modern orthopædic treatment. Maud Forrester-Brown from her lifetime of experience contributes the section on paralysis which includes infantile paralysis, spastic paralysis and peripheral nerve injuries. Injuries and derangements of the spinal column are discussed by A. N. Birkett. Ronald Furlong contributes a very good section on injuries to muscles and tendons. D. L. Griffiths presents a section on certain vascular lesions which complicate orthopædic surgery. It is seldom that these problems are gathered togetner in one essay for discussion though they are of vital concern to the orthopædic surgeon. The final section on bone dystrophies by H. Jackson Burrows is an excellent and complete summary of our present knowledge on this subject.

With essays of such high order contributed by masters in each field it is regrettable that the publishers have not exhibited equally high quality in their craftmanship. The illustrations are especially disappointing. In a subject such as orthopædic surgery good reproductions of radiographs are essential and these and other details of good printing are lacking in what otherwise is a notable addition to the literature of orthopædic surgery.

The Principles of Pathology. R. A. Wallis, Professor of Pathology, University of Leeds, England. 667 pp., illust. 50s. Butterworth & Co. (Publishers) Ltd., London, England, 1950.

The book is not satisfactory. Its faults are those both of omission and of commission. In general, the treatment of disease processes and lesions is much too dogmatic, brief and superficial. Much material that is more germane to textbooks of clinical medicine is included and the content of pathological information is thereby reduced. Dr. Willis has succeeded in writing well below the intelligence and capacity of his prospective readers. An exception to these criticisms must be made for the sections dealing with tumours, since these occupy rather more than one-quarter of the book. The author states that the importance of tumours in pathology justifies utilizing this amount of space, but he dismisses infarction in six pages and myocardial infarction in forty-two lines! Certainly the student is not given a "comprehensive outline expounded from its general principles", which was stated as the author's aim in writing the book.

The illustrations include several diagrams and numerous photomicrographs taken at very low magnifications. Appendices dealing with Greek roots, eponyms, teleological concepts, certain great pathologists, and methods of observing recording and reading are included. The illustrations, in general, are unsatisfactory. This textbook cannot be recommended to North American medical students, and it is somewhat too verbose for use in schools of nursing.

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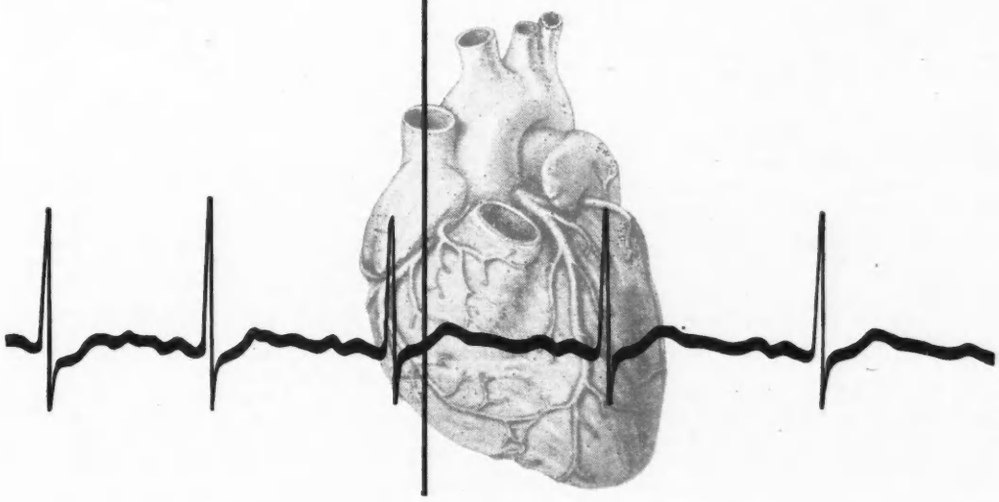

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Essential Urology. F. H. Colby, Chief of the Urological Service, Massachusetts General Hospital, Boston. 580 pp., illust. $9.00. The Williams & Wilkins Co., Baltimore, Md.; Burns & MacEachern, Toronto, 1950.

The publishers have done well with this book, and it comes from the urological service of an excellent hospital. The author cannot have critically examined his manuscript before publication, however, because it contains a number of errors of spelling, repetitions, and unclear statements. The illustrations are on the whole satisfactory, but a few are not accurately linked to the text, and one seems to be upside down. Gross and microscopic pathology are stressed, as important "in preparation for the examination of the Board of Urology". Apparently physiology and biochemistry are regarded as less important for this purpose for they are given much less space. Treatment is also discussed quite briefly, because the book is "mainly for students and treatment is ever changing". This may result in the book going out-of-date less rapidly, but one wonders if it will not also lessen its usefulness.

There are some curious omissions and inclusions of material, whether by carelessness or by choice is not clear. For example, the chapter on examination of the urological patient contains no reference to the sampling or examination of the urine, and nothing about the prostatic fluid. The same chapter includes however, several pages showing the form to be followed for intravenous pyelography, in the author's hospital. Similarly, strictures of the urethra rates a total of about 9 lines of type, while a very rare tumour was assigned 2 pages, including 3 illustrations. In spite of these and other criticisms, the book will be found satisfactory if one does not expect too much.

Traumatologie Fractures, Luxations, Entorses, Traumatologie Générale. R. Bernard, P. Padovani, M. Iselin. 706 pp., illust. Les Traités du Praticien, Paris, 1950.

Since the treatment of fractures has undergone considerable changes for several years, the authors assert that it is most important that practitioners be conversant with modern methods, and they wrote their book with this in mind. It deals not only with fractures, but also with luxations, sprains, contusions and wounds. The descriptions are very elaborate as regards etiology, pathogeny, symptomatology and treatment. Luxations and sprains, by Paul Padovani, agree generally with the Canadian school. The chapter on traumas and associated complications, by Marc Isselin, is very good. It is noted with regret, however, that, in his tome on fractures, Raymond Bernard describes treatments that are out of date and sometimes opposed to modern views. In the opinion of the reviewer, this book is not to be recommended, since it contains nothing new to us, and describes surgical techniques which are out of date and sometimes to be avoided.

Practical Statistics in Health and Medical Work. R. R. Puffer, Tennessee Department of Public Health. 238 pp., illust. $4.90. McGraw-Hill Book Co. of Canada, Toronto, 1950.

As the Director of the Statistical Services of the Tennessee Department of Public Health since 1933, the author of this book has had a wide experience in all fields of public health, and this is reflected in the practical aspects of biostatistical analysis which are the chief attractive features of the book. The chapters on the planning of programs, methods of handling statistical data, methods of study of development of disease in relationship to time and utilization of industrial data are examples. The case histories are very instructive. But for the novice in medical biometry, which includes the vast majority of physicians, more is needed than that which the book contains about the fundamentals for the necessary appreciation of the limits of mathematical formulæ in statistics. This the author recognizes by referring the reader on page 89 to such publications as A. Bradford Hill's "Principles of Medical Statistics" and Yule's "Introduction to the Theory of Statistics". The book is highly recommended for health officers and students in advanced research who have basic knowledge of the science of statistics. But with the view of the author of the Foreword, namely, that the book is also a guide for physicians in general and for nurses concerned with public health, it is difficult to agree.

German Aviation Medicine, World War II, in 2 vols. Prepared under the auspices of the Surgeon General, U.S. Air Force, Department of the Air Force. Vol. I, 648 pp.; vol. II, 1302 pp., illust. $8.50. U.S. Government Printing Office, Washington, D.C., 1950.

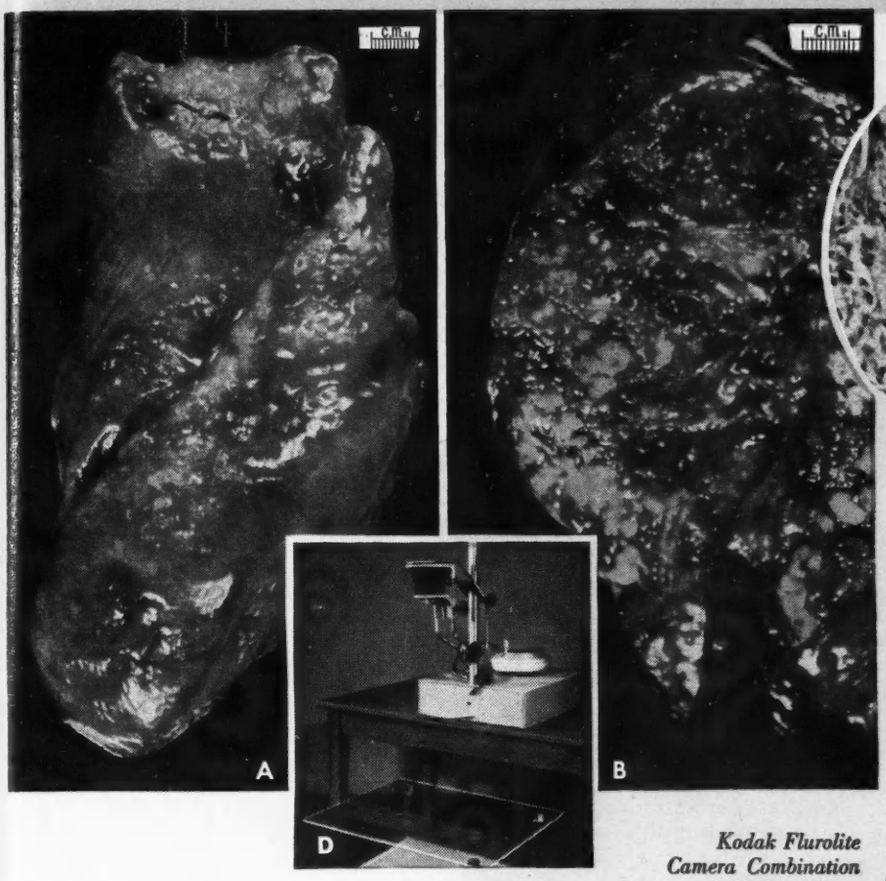
These two volumes contain the work of a group of German scientists on aviation medicine. A great deal of basic aviation work was done in Germany during the war, but it became scattered and lost. At the close of the war Major General M. C. Grow, first Surgeon General of the U.S. Air Force, organized a small unit to deal with assembling all the aeromedical information it could gather in Germany. Later he suggested a compilation of German work in aviation medicine by outstanding German workers, and these volumes are the result. There is much of general interest in addition of course to technical material, and these volumes will contribute much to the progress of aviation medicine. Problems of heat and cold in aviation; emergency procedures, with chapters on rescue service at sea; effects of air warfare on the civilian population; are amongst the subjects dealt with. The U.S.A.F. School of Aviation Medicine is to be congratulated on making possible this worthy contribution to aviation medicine.

General Psychotherapy Dynamics and Procedures. D. E. Cameron, Professor of Psychiatry, McGill University; Psychiatrist-in-Chief, Royal Victoria Hospital; Director, Allan Memorial Institute of Psychiatry. 300 pp. $6.00. Grune & Stratton, New York; The Ryerson Press, Toronto, 1950.

The author has systematically covered the field of general psychotherapy, omitting such special procedures as psychoanalysis. Included in this volume are certain psychological concepts upon which many of the psychotherapeutic techniques operate, and certain of the basic concepts of the dynamics of Psychotherapy. A large proportion of the book is spent on direct and non-directive psychotherapy, the selection of cases for each method, and the procedures and pitfalls of both approaches. Interspersed throughout his discussion of these psychotherapeutic techniques are fragments of interviews in which the author illustrates the point under discussion. There are also certain chapters on the adjuvants of psychotherapy, on hypnotherapy, group psychotherapy, nursing psychotherapy, and social psychotherapy. Dr. Cameron has drawn from his long experience in general psychotherapy to write a book which is well organized and in which he has covered much ground in surprisingly little space. Of necessity some of the chapters are brief but this is understandable because of the wide field under study. This book would seem to find its greatest value for the general psychiatrist in training, for the internist, and also for one seeking a scheme for the management for those mentally sick who are amenable to psychotherapy.

Progress in Gynæcology. J. V. Miegs, Clinical Professor of Gynæcology, Harvard Medical School; and S. H. Sturgis, Clinical Associate in Gynæcology, Harvard Medical School. Vol. II, 821 pp., illust. $11.50. Grune & Stratton, New York; The Ryerson Press, Toronto, 1950.

In this volume, advances in gynæcology have been recorded by many eminent authors who have made their chapters their own particular hobby. A visit by Dr. Meigs to Europe in 1949 has been followed by the participation in the scheme of several European in-



Reproductions A *and* B *show gross aspects of diseased lung after pneumonectomy. Reproduction* C *shows photomicrograph made from histological section of affected lung.*

Illustration D *shows setup of Kodak Flurolite Enlarger fitted with Camera components for the photography of gross specimens.*

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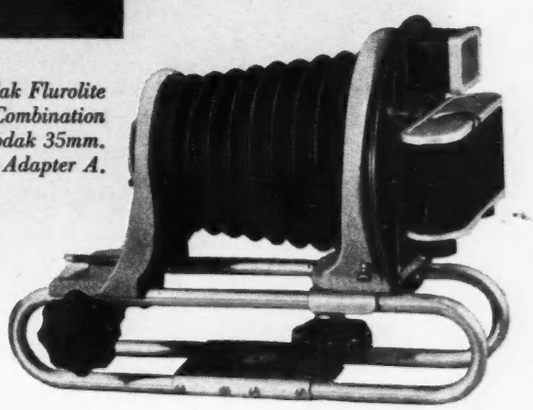

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vestigators, with happy results. All the chapters in this volume have been revised or contain entirely new material. Though the book is intended primarily for the specialist or resident, the general practitioner will find much to interest him and in particular he will find the section on diagnosis and treatment of sterility of great help in planning a comprehensive investigation. Dr. Dameshek's refreshing chapter on the hæmatological problems in gynæcology will repay careful reading and there is an excellent account of Wertheim's operation. The other chapters are of as high a standard, presenting a critical analysis of recent work in all fields where there have been advances.

Biological Studies with Polonium, Radium, and Plutonium. Edited by R. M. Fink, Associate Clinical Professor of Physiological Chemistry, School of Medicine, University of California at Los Angeles; Research Chemist, Birmingham, Veterans' Administration Hospital, Van Nuys, California. 411 pp., illust. $4.55. McGraw-Hill Book Co., Inc., New York, Toronto and London, 1950.

This book is a highly technical monograph on the methods and results obtained in studies on the distribution and excretion of a series of radio-active elements which acquired prominence in the course of research on the atom bomb. It is indeed necessary nowadays to be thoroughly familiar with the damage which may possibly be inflicted on us in the wake of a bomb. Thus, this book will be carefully examined by anyone concerned with the possibilities of atomic warfare. The methods used in this work are, besides the well-known methods for quantitative measurement of radio-activity and histological studies of the tissue, the autoradiographic technique, by which the site of deposition of these radio-elements may be detected. A great deal of information on the subject is thus collected in the book. The care and accuracy with which this work was carried out is remarkable. This is not surprising, since the team responsible for it includes some of the best specialists in the field of radio-activity. The project was originated by the now famous Dr. Stafford L. Warren at the University of Rochester. With him were a series of excellent workers: the physicist W. F. Bale; the photography specialist George A. Boyd; the physician J. S. Lawrence; the biochemist W. Mann, and especially the editor of the book, Robert M. Fink. This group did a remarkable amount of research work and obtained a series of results which together will form a bible for anyone who wishes to approach this field.

Coronary Circulation in Health and Disease. D. E. Gregg, Chief Research Physician, Medical Department, Field Research Laboratory, Fort Knox, Kentucky. 227 pp., illust. $5.40. Lea & Febiger, Philadelphia; The Macmillan Co. of Canada Ltd., Toronto, 1950.

Dr. Gregg's researches into the coronary circulation are well known and there are few who would take issue with him on the fundamental facts his work has brought to light. With regard to the present volume, one might wish that the author had defined his audience. The experimental sections, particularly those dealing with procedures, will leave most cardiologists gasping. The more clinical sections will leave them with a sense of frustration for Dr. Gregg, as a scientist, refuses to derive dogmatic conclusions from insufficient data. On the other hand, research workers in the field of cardiovascular dynamics will find some things that they will consider elementary. It is thus obvious that this book is not directed to any special group, but seeks to present a rounded picture of our current knowledge of this subject. The monograph is actually an excellent and exhaustive piece of work, logically worked out step by step. The author first defines the structural features of the coronary bed, then proceeds from this to describe and analyze the experimental methods for studying pressure and flow in the coronary circulation. With this background he continues to a description of the distribution of the coronary blood flow as determined with modern instruments. Naturally the author leans towards acceptance of data derived from closed chest experiments where available, but his discussion of the relevant literature is everywhere fair, clear and illuminating. The chapter dealing with the determinants of coronary blood flow, including as it does both physiological and pharmacological factors, is very well handled and can be read with profit by anyone interested in the heart, even out of context. The last chapter deals with the coronary circulation in disease: here our factual knowledge is sketchier, but the reader will find the problem fairly stated and critically appraised.

Medicinal and Food Plants of British Columbia. I. B. Hudson. 70 pp., illust. $1.50. Published by the author, Victoria, B.C., 1950.

There is a double appeal in this little pamphlet; that which lies, and let us hope will always lie, in the charm of plant life; and the interest which most of us must have in the medical and food aspects of plants. It may seem like turning the clock back to talk of the medicinal values of herbs—to speak of arnica (Leopard's bane) helping bruises and sprains and fatigue; of Labrador tea bush (Ledum) for mosquito bites and rheumatics; of the common oat reducing the desire for alcohol and morphine; of cactus grandiflorus as a heart remedy; of lobelia for asthma; and of the host of other remedies which Dr. Hudson notes. But still one reads on about them and realizes what a wealth of keen observation lies behind the varied and of course sometimes fanciful uses of plants in our gardens, fields and forests. Dealing with British Columbia chiefly, as Dr. Hudson does, much is said about the Indian medicines from flowers and leaves: she speaks of the picture-like Indian names: for instance, the common "chipmunk's tail", which is recommended for piles, is known by the even more descriptive "medicine for the back door".

He must indeed be unheeding who does not respond to Dr. Hudson's plea for a better understanding of the place of plants in our medical lore; and, too, her appeal to preserve them from careless destruction. Many a more pretentious volume fails to give its reader as much pleasure and profit as does this small one. The charming black and white sketches are too sparingly used. They should have entirely replaced the much less impressive photographs.

A Textbook of Histology, Functional Significance of Cells and Intercellular Substances. E. V. Cowdry, Professor of Anatomy, The School of Medicine, Washington University, St. Louis, Mo. 640 pp., illust., 4th ed. $10.20. Lea & Febiger, Philadelphia; Macmillan Co. of Canada, Toronto, 1950.

This new edition of a now standard text has been considerably expanded and revised to make it more generally useful for standard courses in histology. As it now stands, it is in many ways a fascinating book which is rewarding to read. Most interesting to this reviewer is the teaching problem which it poses, for it is not at all a purely descriptive text, but rather an intensely functional one, and as such, highlights the current dilemma in the basic sciences.

It is obvious to most teachers in the field that structure and function can no longer be considered separately in two watertight compartments. Even within the field of function, physiology, biochemistry and endocrinology are all intertwined as, in the field of structure, gross anatomy, histology and embryology are part and parcel of the one subject. With such a broad overlapping it is evident that the student is more confused than aided by the present system of separate teaching. The book under consideration here, for example, is so functional that it becomes difficult to find the straight descriptive portions which presumably are equally essential. Dr. Cowdry deserves considerable praise for his attempt to deal with the problem. The fact that his text has now run to four editions speaks for his fascinating approach to the subject.

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Plastic and Reconstructive Surgery — A Manual of Management. F. Smith, Consultant in Plastic Surgery, Blodgett Memorial Hospital, Grand Rapids, Michigan. 895 pp., illust. $17.50. W. B. Saunders Co., Philadelphia and London; McAinsh & Co. Ltd., Toronto, 1950.

The author is to be commended for a clear portrayal of the value of local shift operations and the principle of multiple excision and the preference of these manœuvres over the more spectacular pedicle and split skin graft reconstructions. He explodes a few of the old "lemons" that have been handed down by rote in publications of the past, and puts to rout many of the radical but impractical operations on lips and cheeks so easily done in diagram but impossible to carry out in actual operation. In a discussion on "pinch" grafts he comes out bluntly and says: "These grafts have no place in surgery of the face and neck. In fact they no longer have any proper place in modern surgery—the 'split' graft is more readily obtained, more easily applied and dressed, and it produces a far superior result."

The management of fractures of the face bones and cleft lip and palate is poorly handled in a book of such otherwise excellent calibre. These subjects are so important in plastic surgery. In discussing fractures of the face bones, fundamental classification and principles are lost in a description of the technical construction of splints, many of which are impractical. It is questionable too if a treatise on surgical infections of the neck and the ligation of neck vessels should be included in such a volume. Otherwise the book is completely up to date and is a good text. It is a little large and detailed to be considered as a manual.

A Symposium on Steroid Hormones. Edited by E. S. Gordon. 396 p.p., illust. $8.50. The University of Wisconsin Press; Burns & MacEachern, Toronto, 1950.

Recent rapid strides in experimental medicine have made it increasingly difficult for investigators to keep abreast of the literature, even in their chosen field, to say nothing of the general fields of work. In consequence, there is a growing use of the symposium or conference at which leading investigators can summarize their more important recent work and discuss their mutual problems. The present volume belongs in this category of publication and provides the investigator with up to the minute coverage of the principal problems in Endocrinology.

Stomach Disease as Diagnosed by Gastroscopy. E. D. Palmer, Major, Medical Corps, United States Army. 200 pp., illust. $10.20. Lea & Febiger, Philadelphia; Macmillan Co. of Canada Ltd., Toronto, 1949.

This is the first book on Gastroscopy to be published in English since Dr. Rudolph Schindler's famous text, "The Endoscopic Study of Gastric Pathology", published in 1933. In it one finds every aspect of diseases of the stomach reviewed from a gastroscopic point of view. A large number of black and white illustrations and over fifty case histories help to demonstrate the various conditions described. The colour plates drawn from gastroscopic observations are well reproduced and show the various gastric lesions to good advantage. One of the most outstanding features is the complete bibliography on each subject discussed by the author. This small book does not cover the technique of gastroscopy but it is one that should be included in the library of everyone interested in gastro-enterology.

Female Sex Endocrinology. C. H. Birnberg, Associate Obstetrician, Chief of Female Sex Endocrinology, and Endocrine Laboratory, Jewish Hospital of Brooklyn. 134 pp., illust. $5.00. J. B. Lippincott, Philadelphia, London and Montreal, 1949.

This small book of 128 pages is written about an extremely complex subject, and thus cannot be compared with more complete presentations. As the author states in his foreword, it is the outgrowth of a series of lectures given in his postgraduate course. He emphasizes that it is not meant to be a comprehensive treatise and does not include controversial material. To the reviewer it is just the above facts which detract from the book. Because of its brevity, explanations which are essential for the beginner regarding hormonal inter-reactions are missing. The author has dealt with his various headings in a dogmatic, concise fashion, ideal for teaching, but obviously leaving many alternative explanations and treatments unmentioned. It is difficult to decide where the value of such a concise presentation may be. As a review for a student or practitioner who has become fairly well read in the subject it may prove useful.

Obstetrics and Gynæcology. B. M. W. Dobbie, Honorary Surgeon, Birmingham and Midland Hospital for Women. 358 pp., illust. $5.50. Paul B. Hoeber, Inc., New York, London, 1949.

This book is presented as a synoptic guide to treatment, and the author stresses in her preface that it is not a textbook. Her intention rather has been to provide a perspective, addressed chiefly to the general practitioner. It is written in England, obviously for the home practitioner, and thus has less value perhaps, in Canada.

In the first five chapters the essentials of antenatal care, and the management of abnormalities during pregnancy are given. In each instance treatment is divided into that advisable in the home, and that which should only be undertaken in hospital. Normal and abnormal domiciliary midwifery is fully discussed in the ensuing 55 pages. The treatment of abnormalities during labour is outlined in clear and concise fashion. This method of presentation, increases the value of the book as a quick, ready reference, of pocket size for the practitioner. Admonitions are many and the method of presenting them is dramatic. For example chapter 22 deals with "Common errors in Obstetrics", and opens with the remark—"The entries in capitals may be read as if writ in blood!".

Dr. Dobbie has accomplished her object in preparing a reference handbook for the practitioner who may have to follow in her footsteps and perform "single-handed midwifery by candlelight, with a tipsy volunteer and a cracked jug for blood transfusion, and responsibility for death under midwife-administered anæsthesia in a slum tenement".

Stress. Hans Selye, Professor and Director of the Institut de Médicine et de Chirurgie Expérimentales, Université de Montréal. 822 pp., illust. $14.00. Acta Endocrinologica Inc., Montreal, 1950.

There are a few books published in any one generation which are of fundamental importance by virtue of the new impetus and direction which they give to the fields of Medicine. This review is concerned with such a book. Its main thesis is the General Adaptation Syndrome, a broad and unifying concept that disease does not depend solely on the causative agent but on the interaction between host and agent. In this relationship, the status of the host is of tremendous importance, for to the specific effects of the disease-producing agent are added the more generalized but non-specific reactions of the host to the stress represented by the damaging agent. From conception to death the body is continually subjected to such stresses, be they emotional or physical, to which it must adapt itself. From the mildest of stresses which evoke little in the way of a response there is a continuous gradation in the severity of these "stressors" to that end of the scale where the reaction of the host may result in death.

As a result of his fruitful researches of many years Selye has gradually evolved the idea that by and large there is a uniform pattern among the manifestations of disease which represents the generalized reaction of the host to the stressing agent. This pattern he has crystallized as the General Adaptation Syndrome. This concept, rather than the many discrete and important ex-

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perimental facts which he has unearthed, may yet prove to be his most significant contribution to Medicine. The efforts of the body to cope with these stresses are many, and wearing. In these efforts the body, too, may overemphasize its reaction. Under these circumstances the adaptive process may "run off the rails" and in so doing present the manifestations of its overactivity as frank disease. Such conditions Selye terms the "diseases of adaptation" and among them lists the manifestations of rheumatoid arthritis, essential hypertension, periarteritis nodosa, and others. This idea has stimulated further investigation and is a significant further development arising from the original concept of the adaptation syndrome. Selye has presented a carefully documented story and an impressive theory. Every practitioner should read the book for himself so as to integrate the concept into his own mind—it will prove helpful in the practical matters of dealing with patients.

The only criticism is a tendency for the author to be carried away in speculation as the logic carries him forward. But for Selye, such speculation means experiment, and from experiment and his theorizing mind may yet come more such unifying and orientating hypotheses as this.

The Physiological Basis of Medical Practice. C. H. Best, Professor and Head of Department of Physiology; and N. B. Taylor, Professor of the History of Medicine and Medical Literature, University of Western Ontario, London. 1330 pp., illust., 5th ed. $12.25. The Williams & Wilkins Co., Baltimore; Burns & MacEachern, Toronto, 1950.

The fifth edition of this widely used textbook is thoroughly up to date, including discussion of the most recent advances in endocrinology. Although it is becoming increasingly difficult to scan the entire field of physiology within a single volume, the authors have succeeded in doing so through careful selection of new material and elimination of some of the old. The illustrations are reasonably plentiful, clear in meaning, and for the most part well drawn. The bibliography is a very useful one, having been selected with a critical sense of what is important. Present interns, residents and recent graduates in Medicine will find this latest edition of Best and Taylor without peer for the application of physiological principles to the practice of medicine. Undergraduate medical students may be hard put to use the book properly, but there is no reason why it should not continue to enjoy its previous popularity with them. Although the book has had to be expanded it is well set and well indexed and, therefore, thoroughly usable.

Essentials of Orthopædics. P. Wiles, Hon. Orthopædic Surgeon, Middlesex Hospital and King Edward Memorial Hospital. 486 pp., illust. J. & A. Churchill Ltd., London; The Blakiston Co., Philadelphia and Toronto, 1949.

This work is a very valuable addition to our contemporary textbooks on orthopædic surgery. It is written particularly for the undergraduate student, the graduate beginning surgical training, and the general practitioner; and it follows a plan of presentation designed to aid the student in obtaining an organized knowledge of the "essentials" of orthopædics, and to guide the practitioner in diagnosis and general plan of treatment of orthopædic problems which he encounters. The subject is first dealt with by regions, the particular affections of each region being considered and its involvement by generalized diseases. Then additional chapters are devoted to description of problems which do not have particular regional affiliation: pyogenic infections, tuberculosis, chronic arthritis, tumours of bone, and congenital defects of bone. Fractures are not included. In so concise a presentation of a wide subject, the author has not been able, or seen fit, to present the uncertainties and hypothetical nature of much of our orthopædic "knowledge", or to discuss varying opinions, but has adopted rather the pedagogical prerogative of authoritative statement. View-points presented are however generally "middle of the road", though they reflect particularly the thought of British orthopædists and even more particularly, of the London group. The author's wide advocacy of manipulative treatment, for example, is backed by the thought and practice of British orthopædic surgeons.

The text is straight-forward and descriptive, and holds interest. It is supplemented by well chosen illustrations of high quality. The book can be highly recommended and deserves the attention not only of students and general practitioners, but also of those whose special interest is in this field.

Continued on page 41

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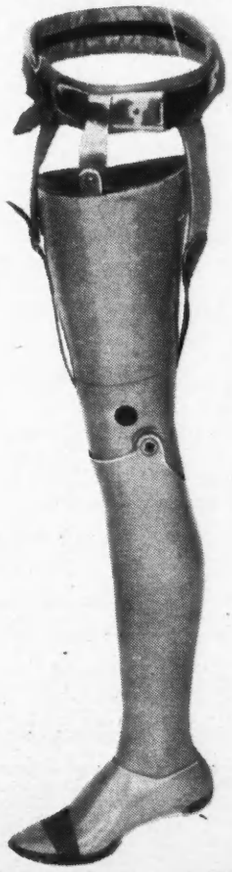

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Books are acknowledged as received, but in some cases reviews will also be made in later issues.

Cleft Palate and Speech. M. E. Morley, Speech Therapist to the Royal Victoria Infirmary, The Hospital for Sick Children, and the Newcastle General Hospital, Newcastle-upon-Tyne. 2nd ed., 160 pp. illust. $2.40. E. & S. Livingstone Limited, Edinburgh; Macmillan Co. of Canada Ltd., Toronto, 1951.

Rest and Pain. J. Hilton, Edited by E. W. Walls, Professor of Anatomy in the University of London at Middlesex Hospital Medical School and E. E. Philipp, Honorary Demonstrator in Anatomy. 503 pp. illust. 25s. G. Bell & Sons Ltd., London; Clarke, Irwin & Company Limited, Toronto, 1950.

Injuries of the Knee Joint. I. S. Smillie, Lecturer in Orthopædics in the University of St. Andrews. 2nd ed., 391 pp. illust. $9.50. E. & S. Livingstone Ltd., Edinburgh; Macmillan Co. of Canada, Toronto, 1951.

America's Baby Book. Prepared under the Auspices of the New York Herald Tribune Home Institute, by J. C. Montgomery and M. J. Suydam. 457 pp. illust. $3.98. Charles Scribner's Sons, New York, London; S. J. Reginald Saunders & Co. Ltd., Toronto, 1951.

A Synopsis of Surgical Anatomy. A. L. McGregor, Senior Surgeon, Johannesburg General Hospital. 7th ed., 778 pp. illust. $4.75. John Wright & Sons Ltd., Bristol; Macmillan Company of Canada, 1950.

The Normal Encephalogram. L. M. Davidoff, Director of Neurological Surgery, Beth Israel Hospital, New York City, and C. G. Dyke, late Associate Professor of Radiology in the College of Physicians and Surgeons, Columbia University. 3rd ed., 240 pp. illust. $7.20. Lea & Febiger, Philadelphia; Macmillan Company of Canada, 1951.

Pharmacology and Therapeutics. A. Crollman, Professor of Pharmacology and Chairman of the Departments of Physiology and Pharmacology, University of Texas. 828 pp., illust. $12.00. Lea & Febiger, Philadelphia; Macmillan Company of Canada, 1951.

Eternal Eye. H. Graham. 699 pp., illust. 42s. William Heinemann, Medical Books, Ltd. London, 1950.

English-German Medical Dictionary. F. S. Schoenewald. 242 pp. 35s. H. K. Lewis & Co., London, 1951.

Medical Treatment, Principles and their Application. G. Evans, Consulting Physician, St. Bartholemew's Hospital. 1464 pp. illust. $26.25. Butterworth & Co. (Canada) Ltd., Toronto, 1951.

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James Lind: Founder of Nautical Medicine. L. H. Roddis, Captain, Medical Corps, U.S. Navy. 177 pp. illust. $3.00. Henry Schuman, Inc., New York, 1951.

A.M.A.'s Primer on Fractures. Prepared by the Special Exhibit Committee on Fractures in Co-operation with the Committee on Scientific Exhibit of the American Medical Association, 6th ed., 109 pp., illust. $2.00. Paul B. Hoeber, Inc., New York, 1951.

Textbook of Physiology and Biochemistry. G. H. Bell, Professor of Physiology in the University of St. Andrews at University College, Dundee; J. N. Davidson, Gardiner Professor of Physiological Chemistry in the University of Glasgow; and H. Scarborough, Professor of Medicine in the Welsh National School of Medicine of the University of Wales and Director of the Medical Unit in the Royal Infirmary, Cardiff. 918 pp., illust. $8.50. E. & S. Livingstone Ltd., Edinburgh; Macmillan Co. of Canada Ltd., Toronto, 1950.

An Introduction to Industrial Mycology. G. Smith, Research Demonstrator, Department of Biochemistry, London School of Hygiene and Tropical Medicine. 3rd ed., 271 pp., illust. $4.00. Edward Arnold & Co. Ltd., London; Macmillan Co. of Canada Ltd., Toronto, 1950.

The Asthmatic Child. G. F. Walker. 19 pp., illust. $0.50. John Wright & Sons Ltd., Bristol; Macmillan Co. of Canada Ltd., Toronto, 1950.

Personality and its Deviations. G. H. Stevenson, Professor of Psychiatry, University of Western Ontario; and L. E. Neal, Assistant Professor of Psychology, University of Western Ontario. 362 pp., illust. $4.00. The Ryerson Press, Toronto; Charles C. Thomas, Springfield, Ill., 1950.

Anopheles and Malaria in the Near East. H. S. Leeson, W. H. R. Lumsden, J. Yofe and T. T. Macan. 219 pp., illust. 35s. H. K. Lewis & Co. Ltd., London, England, 1950.

Diseases of the Heart and Circulation. P. Wood, Director, Institute of Cardiology, London. 589 pp., illust. 70s. The Practitioner, London; Eyre & Spottiswoode, London, 1950.

The Enzymes. Edited by J. B. Sumner, Laboratory of Enzyme Chemistry, Cornell University, Ithaca, N.Y., and K. Myrback, Institute for Organic Chemistry and Biochemistry, University of Stockholm, Sweden. Vol. 1, Part I. 724 pp., illust. $13.50. Academic Press Inc., New York, N.Y., 1950.

Physiology of Shock. C. J. Wiggers, Professor of Physiology and Director, Department of Physiology, School of Medicine, Western Reserve University. 459 pp., illust. $5.00. The Commonwealth Fund, New York, N.Y., 1950.

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The Neural Crest. S. Horstadius, Professor of Zoology, University of Uppsala. 111 pp., illust. $3.00. Oxford University Press, London, New York, Toronto, 1950.

Renal Function. Transactions of the First Conference October 20-21, 1949, New York. Edited by S. E. Bradley, Department of Medicine, College of Physicians and Surgeons, Columbia University. 172 pp., illust. $2.50. Josiah Macy, Jr. Foundation, New York, 1950.

Liver Injury. Transactions of the Eighth Conference, April, 1949, New York. Edited by F. W. Hoffbauer, Department of Medicine, University of Minnesota Medical School. 164 pp., illust. $1.60. Josiah Macy, Jr. Foundation, New York, 1950.

Conference on Cybernetics. Transactions of the Sixth Conference, March, 1949, New York. Edited by Heinz von Foerster, Department of Electrical Engineering, University of Illinois. 209 pp., illust. $3.50. Josiah Macy, Jr. Foundation, New York, 1950.

Metabolic Interrelations. Transactions of the Second Conference, January, 1950, New York. Edited by E. C. Reifenstein, Jr., Sloan-Kettering Institute, New York. 279 pp., illust. $3.95. Josiah Macy, Jr. Foundation, New York, 1950

Biological Antioxidants. Transactions of the Fourth Conference, December, 1949, New York. Edited by C. G. MacKenzie, Department of Biochemistry, University of Colorado School of Medicine. 181 pp., illust. $3.25. Josiah Macy, Jr. Foundation, New York, 1950.

Problems of Aging. Transactions of the Tenth and Eleventh Conferences, February, 1948 and April, 1949, New York. Edited by N. W. Shock, Chief, Section of Gerontology, National Heart Institute. 258 pp., illust. $3.75. Josiah Macy, Jr. Foundation, New York, 1950.

Blood Clotting and Allied Problems. Transactions of the Third Conference, January, 1950, New York. Edited by J. E. Flynn, Department of Pathology, College of Physicians and Surgeons, Columbia University. 224 pp., illust. $3.00. Josiah Macy, Jr. Foundation, New York, 1950.

Physical Diagnosis. R. H. Major, Professor of Medicine, University of Kansas. 446 pp., illust., 4th ed. $7.25. W. B. Saunders Co., Philadelphia; McAinsh & Co. Ltd., Toronto, 1951.

Traitement des "Lassitudes". P. Bergouignan. 137 pp. 375 francs. Vigot Freres, Paris, 1951.

Functional Anatomy of the Limbs and Back. W. H. Hollinshead, Head of Section on Anatomy, Mayo Clinic, Rochester. 341 pp., illust. $6.60. W. B. Saunders Co., Philadelphia; McAinsh & Co. Ltd., Toronto, 1951.

Anatomy of the Nervous System. O. Larsell, Professor of Anatomy, University of Oregon Medical School, Portland. 520 pp., illust., 2nd ed. Appleton-Century-Crofts, New York, 1951.

Le Message de L'Acuponcture. E. van Rijckevorsel. 22 pp., 2nd ed. 100 francs français. Vigot Freres, Paris, 1951.

Allergie et Traitement Sclerosant. R. Tournay et R. Vieville. 102 pp. 450 frs. Vigot Freres, Paris, 1951.

Pædiatric Allergy. R. Chobot, Assistant Clinical Professor of Pædiatrics, N.Y. University-Bellevue Medical Centre. 284 pp. $5.85. McGraw-Hill Co. of Canada Ltd., London, New York, Toronto, 1951.

Occupational Factors in the Etiology of Gastric and Duodenal Ulcers. R. Doll and F. A. Jones. 96 pp., illust. 2s. 6d. His Majesty's Stationery Office, London, 1951.

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